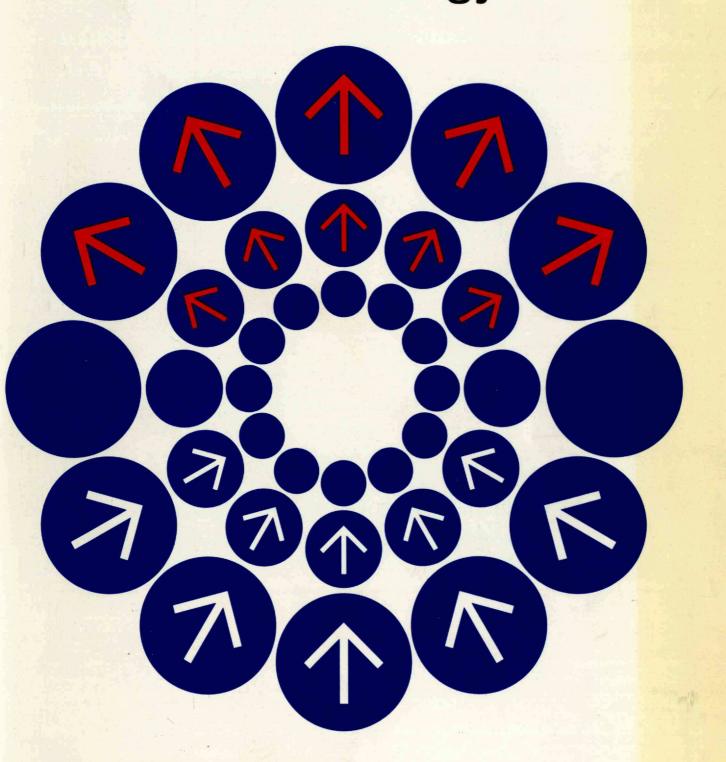
Edited at the Massachusetts Institute of Technology October/November, 1967

Vannevar Bush on The Search for Understanding

Communications Among Scientists

Technology Review



technology review

Published by MIT

This PDF is for your personal, non-commercial use only.

Distribution and use of this material are governed by copyright law.

For non-personal use, or to order multiple copies please email permissions@technologyreview.com.

A major use of Asarco copper is corrosion-resistant tubing used extensively in desalination plants built to combat the growing water shortage. This plant produces 720,000 gallons of fresh water daily.



Asarco capability in metals

helps make salt water potable reduces noise levels improves smelting and refining processes

In a new bank building in Boston, noise is muffled with lead sound barriers. Asarco is installing new equipment to make continuous-cast lead sheet for use in sound attenuation.



Zinc is studied in Asarco's laboratories and plants. The retort process shown here produces Prime Western zinc which is used in galvanizing.



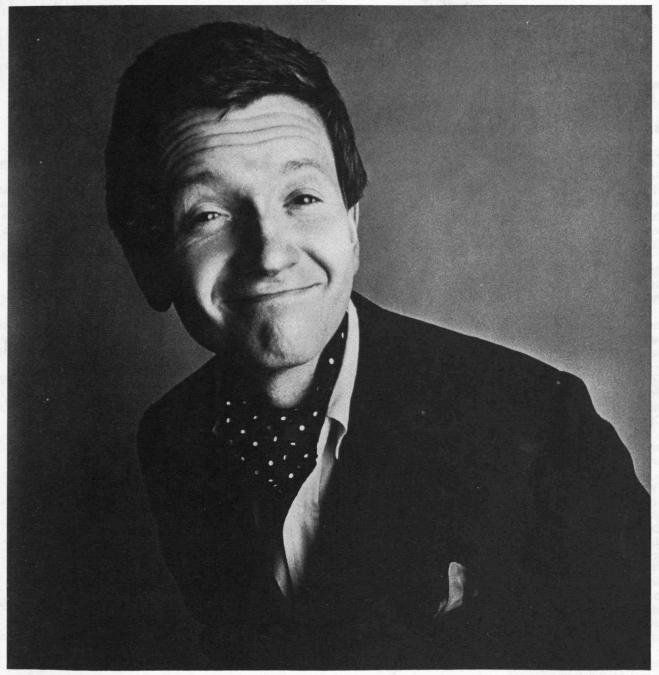
Capability in metals grows through continued research on production techniques. Asarco is always seeking new ways to improve the high quality of its nonferrous metals and alloys . . . and is developing new shapes and forms for its products to satisfy customer requirements.

Capability in metals has brought about new techniques in the use of copper, silver, lead and zinc, as well as less common metals such as bismuth, cadmium, selenium and tellurium. It makes available practical information on these metals and their alloys. Helps Asarco's customers make better products for less money.

ASARCO AMERICAN SMELTING AND REFINING COMPANY 120 BROADWAY, NEW YORK, N. Y. 10005

Capability . . . diversity . . . and quality in: copper, silver, lead, zinc, arsenic, bismuth, cadmium, indium, selenium, tellurium, thallium, asbestos, brass and bronze alloys, continuous-cast bronze rods and tubes, aluminum alloys, corrosion protection products, anodes and chemicals for plating, solder and brazing alloys.

"I'm sure Father would have wanted me to have a Rolls."



We're used to being given plenty of rope in our work as trustee. And most of the time the requests we get are reasonable. But every once in a while, a beneficiary throws us a curve. Then we have to be firm. That's why this young man probably won't get his Rolls Royce.

Acting as trustee—as executor or guardian, too—is a big and responsible job. We try to face each

problem with a steady eye to both sides of the equation — the financial and the human. We feel it is this basic philosophy, as much as anything else, that has made us the largest trust institution in New England.

When you are considering your family's future, keep us in mind. We'll be glad to work with you and your lawyer to make your plans come true.

THE FIRST & OLD COLONY

The First National Bank of Boston and Old Colony Trust Company



Technology Review,
Reg. U.S. Patent Office, is published
nine times each year (in October/
November, monthly from December
through June, and in July/August) at
the Massachusetts Institute of
Technology.

Copyright 1967 by the Alumni Association of the Massachusetts Institute of Technology.

Inquiries regarding editorial contents, subscriptions, and advertising should be addressed to:

Technology Review Room E19-430 Massachusetts Institute of Technology Cambridge, Massachusetts, 02139.

Area code 617, telephone 864-6900, extension 4871.

Technology Review is printed by the Lew A. Cummings Company, Manchester, New Hampshire. Second class postage paid at Manchester, New Hampshire.

Price: \$1 per copy, \$7 per year in the United States, \$7.50 in Canada and foreign countries. Please allow three weeks for changes of address, and give both old and new addresses in all requests.

Donald P. Severance, '38, Publisher John I. Mattill, Editor
Peter Gwynne, Managing Editor
Richard F. Wright, Advertising
Manager
Ruth King, Associate Editor
Ralph Coburn, Art Director
Karen Ahern, Assistant Editor
Freda B. Rich, Alumni Editor
M. Dale Reeves, Production Manager
Margaret S. Goodhue, Advertising
Assistant
John S. Pfeil, Jr., '43, Business
Manager

Next month

A special note

In the December Technology Review, look for a statement on the need to foresee both the benefits and the dangers of a new technology by Congressman Emilio Q. Daddario; a report on a new integration of technology and the fine arts by Gyorgy Kepes; and a summary of the new technology of concrete by Henry N. McCarl, '62, and George H. K. Schenck.

With publication of "Recent Advances in Holography" in May, 1967, Technology Review inadvertently became party to a controversy about the origins of certain scientific work. We lament both the fact of the controversy and our involvement in it.

Humanities



Edited at the Massachusetts Institute of Technology Volume 70, Number 1 October/November, 1967

Technology Review

Departments	Government Review	Victor K. McElheny		
	Science Review	Robert C. Cowen, '49	10	
	Book Review	Joseph Mindel	12	
	Strobe Probe	Harold E. Edgerton, Sc.D. '31	73	
	Puzzle Review	Allan J. Gottlieb, '67	74	
	Correspondence Review		76	
Articles	The Search for Understanding Man's knowledge is extended: ultimate questions become more confounding	Vannevar Bush, '16	21	
	Human Resources for Enterprise Management Cause-and-effect relationships can work between personnel needs and policies	Mason Haire	25	
	Communications in the Research and Development Laboratory "Technological gatekeepers" intro- duce new ideas into laboratories	Thomas J. Allen, Jr., Ph.D. '66	31	
	How I Stopped Worrying and Learned to Live with Irrationality Emotions often overpower logic in organizational changes	Arnold S. Judson, '47		
Trend of Affairs	Northeastern radio astronomers unite The rhythm of nutrition LES-5: inter-service cooperation New evidence for drifting continents Technology's impact on medicine Do toddlers think logically? Probing the structure of milk A new loan plan for higher education On-board computers for satellites Smoke rings to reduce pollution Secondary electron spectroscopy Magnetic experts come to Boston Floating airports for mass transport		49	
Institute Review	The 1967 Alumni Seminar, a new vice president, and other events as M.I.T. opens its 102d academic year		65	

MASSA DIVISION

REMOTE and MANNED HYDROACOUSTIC SYSTEMS



All life existing in the ocean depends on sound as its primary means to position itself, to avoid obstacles, to locate food and to communicate. Man is no exception.

With a background of twenty years experience in hydroacoustics, Massa Division offers the facilities and capabilities to design, engineer, develop and produce underwater components and systems for navigation, communication, detection and remote control. These devices meet exacting requirements of pressure, power, directivity, endurance and a wide range of frequencies. For details on experience, capabilities, facilities and products, write for Sonar Brochure.



Equal Opportunity Employer

MASSA DIVISION DYNAMICS CORPORATION OF AMERICA 280 LINCOLN ST. HINGHAM, MASSACHUSETTS 02043



This is our man in charge of saying "No."

No to Captains. No to Vice-Presidents. And even no to The Chairman of the Board.

Which is just what a good mechanic ought to say.

He thinks nothing of keeping a 7 million-dollar airplane in the hangar because a 10¢

part needs replacing.

Or checking the burbling air in a fan-jet 20 times—until he's satisfied it's burbling just right.

All of which, we're proud to say, has made American one of the most dependable airlines in the business.

We wouldn't dare be otherwise.

We built this airline with the professional traveller in mind—the man who rates an airline on the service it gives, not how glamorous it looks.

And if his plane is late on Sunday, we know his Travel Agent won't be calling us for tickets on Monday.

Or yours, either.

American Airlines

The airline built for professional travellers. (You'll love it.)

fife insurance is a great field if you want to work on your own.



says Walter W. Schlaepfer, Cornell '51 Ithaca, N.Y.

Independence. It's what brought me into life insurance in the first place, and what keeps me in it now, after eleven great years!

Because let's face it—there aren't too many fields left that let a man operate independently, yet still enjoy the benefits large companies can offer—pension plans and group insurance, for example. And not too many jobs let you see results in direct proportion to your efforts.

With Mass Mutual I've found all this—with great personal satisfaction to boot. Mass Mutual's reputation in its field is outstanding—in fiscal management, in service to policyholders, in the caliber of its agents. Not to mention \$3.4 billion in assets and 116 years of experience.

When you join Mass Mutual, you benefit from that experience and integrity. You get financial backing—while you're training—until you're on your feet. But always with the recognition that you're your own man.

If this kind of independence is what you're looking for, why not write to Mr. Charles H. Schaaff, President, Mass Mutual, Springfield, Massachusetts 01101. By the way, he started out as an agent, too!



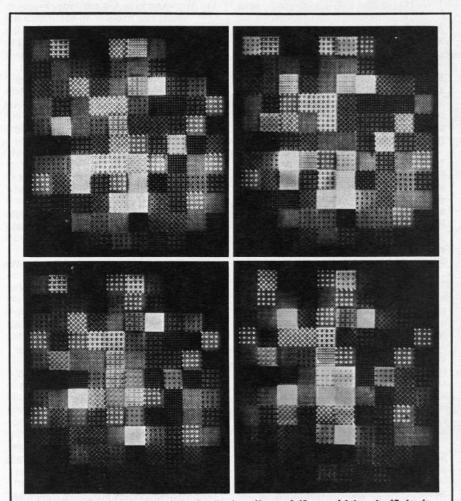
MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY

Springfield, Massachusetts • Organized 1851

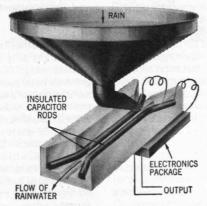
Some of the Massachusetts Institute of Technology alumni in Massachusetts Mutual service: Lyman L. Tremaine, C.L.U., '23, New York Report from

BELL LABORATORIES

Photos of a rainstorm



Sequence of computer-generated rainfall-rate patterns at 10-second intervals. (Order is upper left and right, then lower left and right.) Small "patches" correspond to geographic positions of 93 rain gauges. Each patch can have one of 48 computer representations of rain rate: dark for no rain, gradually brightening for increasing rainfall. Thus, each of the four frames "maps" a rainstorm in the area, and the sequence is like a motion picture. (Detailed data are recorded on magnetic tape for analysis and correlation with radio transmission characteristics, but the display gives a quick overall view.)

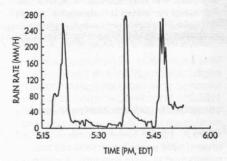


The new rain-rate gauge. Rain collected in funnel, top, flows along 45° incline between two insulated rods...the ejectrodes of a capacitor in an oscillator. Heavier rainfall lowers the oscillator frequency. The gauge can detect one raindrop, yet is accurate within five percent at rates of more than 10 inches per hour.

The pictures at the left represent rain on a 60-square-mile area in east-central New Jersey on November 28, 1966. Actually, they are four photos of a computer-generated display. The brightness of each little "patch" indicates the rainfall rate at each of 93 gauges spaced throughout the area.

We study rainfall because it impairs higher-frequency microwave radio transmission. But no one has had detailed data on its effects. All we had were relatively infrequent rainfall readings from a few gauges near radio paths. We needed—and now have—almost instantaneous readings of rainfall rate from closely spaced gauges over an area.

The result? We have learned a lot about rainfall—for example that heavy, small-area concentrations of rain occur and shift around within a wide-area storm. More important, we can now begin to relate rainfall patterns to specific transmission difficulties. With this information we are improving our strategies for establishing, despite the weather, more reliable radio relay paths at higher microwave frequencies.



Rainfall rate on one gauge during a storm on May 27, 1965. Note rapid response of gauge to changing intensity of rain.



Government Review

American scientists have been mumbling to themselves a good deal lately about the vagaries of their most important patron, the United States government.

Although this patron is supporting creative activity with a munificence not seen before in history, it is showing the whimsicality and political mentality of its princely predecessors.

Scientists have reason to be disturbed by this, but they have not been responding with sufficient confidence or craft. The merits of undirected fundamental research have not diminished because so many more people are doing it, or because the results continue to be used in destructive wars. The interplay between practical needs and scientific studies remains as difficult and refreshing as ever.

As before, the relationship of the scientist with his patron requires that scientists mobilize themselves as an effective pressure group upholding the social value of undirected basic research and pressing for the early, humanistic application of discoveries to everyday life.

Like the British empire of the Nineteenth Century, the scientific American empire of the last 20 years was created in a fit of absence of mind. Now it exists and it is required to justify its continued existence and growth.

This is not easy for scientists who have been allowed for the past 25 years to forget the classical need for a creative man to interest his patron in his work. Now this need is reasserting itself.

In recent years, the U.S. government has done a good deal of talking about how to increase the practical yield of its large spending on science.

This emphasis is not so recent as many might suppose. Almost as soon as the Kennedy administration took office in 1961, the President's science advisory committee began considering the technical aspects of improving the economy of West Virginia, a state whose vote in a crucial 1960 primary had ensured the nomination of John Kennedy, a young outsider in the Democratic party's power structure.

Very early in the expansion of the space program under the vocal and highpressure leadership of James Webb, the National Aeronautics and Space Administration made at least a show of its willingness to find civilian applications of space technology.

The federal government later began to spend some money on improving the technology of house-building and of transportation. Drug safety, air and water pollution, car safety all became technico-political issues demanding research.

The political payoff of the space program began to show limits and influential men in Washington began to pay attention to scientists who argued that the return from oceanic research might be very high. Budgets for oceanography increased rapidly, with a great deal of emphasis on exceedingly costly, maneuverable, deepdiving submarines.

The events most worrisome to scientists occurred in the field of biological and medical research. Here, many scientists and physicians themselves were worried about the extreme dislocations in modern American medicine. An avalanche of discovery was washing over the medical profession, rapidly upsetting established roles. There was a good deal of doubt that medical buildings, equipment and personnel could be effectively mobilized to deliver a modern standard of care to all Americans.

Such an issue of organizing new technology is one which laymen can hope to understand, and soon President Lyndon Johnson was influenced to emphasize the need for more application of medical knowledge. His manner of doing this, at a surprise White House meeting in June, 1966, caused acute distress in the medical research community.

The President praised large-scale crash programs in the health field, practically at the time when a task force under Jack P. Ruina, Vice President for Special Laboratories at M.I.T., was reporting on the management failures of just such an effort, the cancer chemotherapy program. John W. Gardner, Secretary of Health, Education and Welfare, was forced to issue a public statement to the effect that harm was not intended for basic research.

Allied to the pressure for more emphasis on practical outcomes of research was the intense discussion of the geographical distribution of federal research funds. Scientists rightly feared that if such pressure were applied unthinkingly, it could weaken the nation's centers of genuine strength.

With the emphasis on spreading money around, there has been a leveling off of how much there is. The general level of government research support has been on a gently sloping plateau for several years. The leveling-off has taken place not only in the big defense, space, atomic energy and medicine programs, but also in basic research not linked to the major programs.

There are many scientists who feel that some rather flabby but costly programs are surviving under these pressures because of their sheer size. The scientists are sure that projects of high intellectual merit suffer because of this.

More disturbing, perhaps, have been some cuts in quite inexpensive programs of undergraduate and graduate research training. Such cuts have been noticed in the large National Institutes of Health traineeship and fellowship programs, and in the more modest but still significant program of N.A.S.A. Reductions in these programs appear to be cutting the production of new scientists and also to be reducing the quality of instruction of those still supported.

Many scientists of spirit have been angered by the increasing amount of paperwork on scientific research projects, paperwork supposedly designed to reduce Congressional anxiety that federal grant money is not being used for doubtful or downright dishonest purposes. Scientists are convinced that the paperwork does not achieve these ends but makes it harder to do good work.

By hedging its patronage with too many conditions, the U.S. government may seriously hamper the usefulness of its intervention.

But on the other hand, scientists must be prepared to dirty their hands in the political bargaining that accompanies governmental patronage. A great many scientists would argue that they will have nothing to do with what they might consider to be corrupt bargaining, or a dangerous waste of precious hours or years of creative drive. Concern to avoid wasting creative energy in an undignified attempt to curry favor is one thing. But it can so easily turn into an empty standing on dignity, a failure to recognize that forceful advocacy is at the heart of the communication of ideas to fellow scientists-and to the laymen who pay the bills.

There is an increasing number of sci-

entists who realize that there is no necessary conflict between scientific debate and the sort of semi-political debate about location of site, cost and timing of a big commitment in science. Nothing illustrates this more clearly than the high-level consideration given during the summer of 1967 to the future of American radio astronomy (see Trend of Affairs, page 48). Such an effort builds upon one of the most intelligent pieces of scientific advocacy in recent years, the series of reports by the committee on science and public policy (COSPUP) of the National Academy of Sciences, started by George B. Kistiakowsky of Harvard.

These reports on ground-based astronomy, chemistry, physics, plant sciences and so on, have attempted to go beyond the mere statement that certain areas of research need more emphasis.

These reports attempted to identify intellectual problems genuinely available now to scientific research and to estimate what the costs would be. It would be well if such reports were part of a continuing advocacy of the importance of intelligently planned support of fundamental research. But they are not.

Over a number of years, the National Aeronautics and Space Administration has been contracting its Sustaining University Program of grants for fellowships, buildings and equipment, and general support of university space research centers.

This program has not received the kind of sustained support from universities, including M.I.T., that it perhaps deserves. M.I.T.'s own Center for Space Research, announced with such fanfare a few years ago, is completing a \$4.3 million building with \$3 million from the Sustaining University Program with the rest coming from the Second Century Fund.

The center receives broad support from a number of N.A.S.A. programs, including about \$900,000 yearly from the Sustaining University Program. In addition, SUP funds during the federal budget year ending last June 30 funded the full graduate training of nine new students. In three previous budget years, SUP funds had been granted for the training of 15 students each year.

To guarantee a measure of stability to centers like the one at M.I.T., the SUP program grants funds for up to three years. The full three years of a graduate student's training are funded at one time. The annual general support grant comes in a "stair-step" form, say \$900,000 for the first year, \$600,000 for the second year and \$300,000 for the third. Thus, even if the program were cut off suddenly without a penny, such centers can phase out gradually or find funds elsewhere somewhat more easily.

The M.I.T. Center has a more than local importance, because it has been entrusted with the development of a whole scientific satellite.

The satellite, a rather simple one, is called Sunblazer. It is designed to be launched into orbit around the sun aboard a five-stage Scout rocket. During its passages around the sun, it will broadcast back to earth on 75 and 225 megacycles.

Comparisons of the signals at these two frequencies detected on earth should give an idea of the electron density along the signal path. The polarization of the radio waves should give information on the magnetic fields encountered along the way.

When the satellite is on the opposite side of the sun from earth, the radio waves should serve as a probe of the sun's corona very close to the sun's surface, a region unlikely to be penetrated in another way.

The design of such a satellite was reasonably within the ability of a single university laboratory and represented an intelligent attempt to find a place for "little science" within the gigantesque space program.

As specific support for the Sunblazer program, Center Director John V. Harrington, Sc.D. '58, Professor of Electrical Engineering, has been granted in the past three fiscal years a total of \$1,123,534.

The Sunblazer project received relatively little public attention until January, 1967, when top N.A.S.A. officials laid considerable stress on it in describing N.A.S.A. programs at a budget briefing for the press.

N.A.S.A. had decided to ask Congress for a total of \$6.38 million for Sunblazer in the budget year that began last July 1. Of this, \$2.38 million was for building an antenna in California, \$2 million for a start on building five Sunblazers and \$2 million for rockets to launch them.

In June, as Congress considered authorizations for N.A.S.A., the Senate space committee recommended deferring these items for a year despite the program's general acceptability. The House left them in without comment. In conference, after an intervention by Sen. Edward Brooke (R-Mass), the items were restored.

But this was only half the battle in a Congress intent on cutting all non-Vietnam spending.

The Vietnam war's very high cost, combined with the accident last January which killed three astronauts during a ground test of their Apollo capsule, crystallized many forms of impatience with the space program and its masterful direction by James Webb.

At hearings on the Apollo tragedy, Webb refused so vigorously to be a sacrificial lamb that he antagonized some of his warmest supporters in both houses of Congress. His posture toward them was that Congress shared in all space policy decisions and that any investigation of the Apollo accident could have only one purpose, "to get ready to fly again." This

position was undercut when, with the encouragement of Science Editor William Hines of the Washington Star, it became possible for Rep. William Fitts Ryan (D-NY) to make public an assessment of the main Apollo contractor, North American Aviation. Although the relevance of this 1965 report to the actual circumstances of the fire was unclear, N.A.S.A.'s reluctance to release it clouded the agency's tactical position budgetwise.

It was possible during the debate on authorizations for members of the House space committee to lead a floor effort to cut \$200 million more out of the space budget than the committee itself had done. Leading this effort was Rep. James Fulton (R-Pa).

Many of these extra House cuts were altered in conference. But at the appropriations stage, the House was not so generous. Cuts of \$250 million overall in the authorization became cuts of \$516 million. Out went the appropriation for the Sunblazer antenna and deep cuts were made in such programs as launch vehicle procurement and physics and astronomy, from which N.A.S.A. planned to fund Sunblazer—even though the complex bargaining over authorizations had removed specific "language" supporting Sunblazer.

House action came late in August, at a time when most top M.I.T. officials were at their favorite wooded or sandy places of retreat. Action in the Senate began before M.I.T. officials made any representation of their own on Sunblazer.

This was very late in the game, and the task of M.I.T. officials was made more difficult by a statement from President Johnson approving the House action in cutting the space budget. Still, a long letter went from Provost Jerome B. Wiesner to the office of Sen. Edward M. Kennedy (D-Mass), where it produced a strong impression. M.I.T. officials also contacted members of the Senate Appropriations Committee. It was a departure from custom, but a necessary one that will have to be repeated.

There was an almost simultaneous illustration of this. In September, the Senate Appropriations Committee decided on a cut of \$46 million from an administration request of \$505 million for the National Science Foundation.

An unusual coalition in the committee had pushed this through, despite the inner displeasure of the chairman, Sen. Warren G. Magnuson (D-Wash). Sen. Edward Kennedy joined with Sen. Fred Harris (D-Okla) to plead with the Senate to restore the full appropriation. They won.

Is it too much to hope that scientists in the 1200 colleges and universities where N.S.F. supports research will let the two Senators know they are grateful?

Victor K. McElheny is Science Editor of The Boston Globe and Contributing Correspondent of Science Magazine.

Science Review

Put yourself in a Briton's shoes. Realizing that computers will be intimately woven into your industry, your government, indeed into the fabric of your national security, would you want to depend on buying American equipment?

Or, admitting it would be cheaper to buy American rockets and communications satellites, should you opt out of space technology? Would you want to do it knowing that every major technical field you neglect makes it just that much harder for your country to survive as an industrial nation?

Such questions, flung at me by leaders in Great Britain's research establishments during a recent visit, reflect a determination to make Britain a technically effective country again. It would be presumptuous to judge the temper of a nation from a few weeks of interviews and laboratory tours. Yet the brief, kaleidoscopic view I had showed intense ferment.

Britain is fed up with her lagging economy, fed up with an industrial complex that fails to make the most of advanced scientific and technical knowledge. She is looking hard at the deployment of her research and engineering resources.

All of this makes the British research scene exceptionally fluid as the country strives to find a viable way of life as a small, yet technically potent nation.

The notion that a strong national effort in basic science will mean a vigorous industry doesn't cut much ice any more. Men such as Lord William Penny, retiring Chairman of the Atomic Energy Authority; Sir Harry Melville, retiring Secretary of the Science Research Council; or Dr. John Adams, member for research of the A.E.A., are openly skeptical. For 20 years, they explain, one of Britain's articles of faith has held that the route to an industry that can compete in world markets lies through scientific research. Britain, they note, has spent a lot on science. Yet her economy is still in a jam.

No one questions the long-term value of pure science or suggests that it be cut back. But, from now on, pure research funds will grow less rapidly. In the over-all government budget, new emphasis will be put on research that will pay off industrially in 5 to 10 years, or less.

Basic science will not suffer. Melville projects an increase, in real terms, of 9 to 10 per cent in such research funds over the next three years. But if applied research is to be boosted, certain entrenched attitudes must change. The tradition that scientifically bright people don't dirty their hands with applied work is frustrating. Even when university work could be practical, it often is published without getting effective use in industry.

This, Melville notes, is a "people problem." "Academics," he explains, "don't like being told they should be concerned about vocational education, that they have an obligation to educate people to take effective parts in industry." To try to shift this attitude, the Science Research Council took what Melville calls "drastic action."

The universities' main support comes from the University Grants Committee. This underwrites university budgets for five-year periods. But the S.R.C., in an analogous role to that of the American National Science Foundation, supports a good deal of the research programs. Among other things, it grants studentships which support various student research projects.

Melville's "drastic action" consisted in earmarking 10 per cent of this year's studentships for applied research. Universities could only get at that money by showing that student projects would directly benefit the country. Next year, another 10 per cent will be similarly earmarked and so on until pressure is built up to channel a significant number of students into applied research.

In a tradition-bound academic world, even such mild measures may seem drastic. However, action on the university front is minor compared to the assault on entrenched attitudes in industry.

Many technically based firms rank high. They have strong technical staffs. They make effective use of new techniques and knowledge. But many other companies fall down badly. They are too small to support an effective technical staff. Or they may be saddled with managements oblivious to engineering science. Or they may suffer both impediments.

There is the amusing (in retrospect) story of how the introduction of color film was slowed after the war. Britain confiscated German color patents. A leading photographic firm was asked to exploit them. As this involved sophisticated chemistry, the firm was encouraged to join forces with a chemical company. Now the photo concern was a good company. But its top

board, which did not influence its operations much, was more of an old boys' club where stock tips were exchanged than a working part of management. Faced with the prospect of meeting the technically astute board of the chemical company, the photo company board vetoed the deal. It feared its incompetence would show.

This story burlesques the situation in much of British industry today. It was told to me off the record by one of the Ministry of Technology's senior advisers to illustrate what Britain is up against in trying to improve its industry.

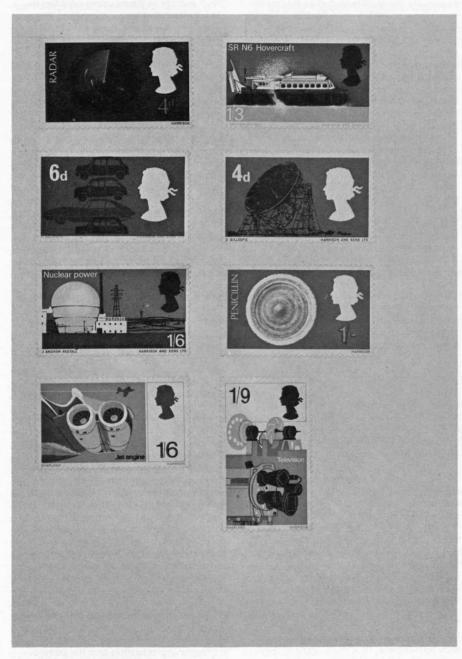
Britain is like a family that can't quite make ends meet. A marginal increase in net export income could make the difference between growing prosperity and creeping bankruptcy. In trying to gain this all-important margin, management attitudes are decisive, my informant said. He sees the vaunted "technology gap" between Britain and the United States as a management gap.

The tradition of technically illiterate management, typified by the color film story, sets a tone that discourages effective use of applied science in many companies. Such firms neither know how to use technical information nor how effectively to employ industrial scientists.

This attitude problem also underlies the brain drain, which is far more serious for engineers than for pure researchers. The drain flows, ultimately, from salary pressure. Engineers and industrial scientists are badly paid, even by British standards. A senior researcher typically earns under \$10,000 while his or her management colleagues may earn considerably more. Add this low income to uninspired use of technical talent and the brain drain is inevitable.

Industry counters such criticism by claiming that government ties up talent in its own research establishments such as Harwell. But Lord Penny and John Adams, when asked about this, pointed out that industry is free to recruit from government laboratories. Indeed, it is encouraged to do so. There just have not been enough attractive opportunities in industry to draw high-grade talent away.

The government, especially the Ministry of Technology, tries to come at this problem on several levels. For firms too small to support their own technical teams, it has set up such services as consulting centers at technical colleges. Here,



Britain's campaign to emphasize and strengthen its technology has even included such obscure propaganda media as postage stamps. Two sets have now appeared in as many years to celebrate the modern achievements of scientists and engineers in the U.K.

practical problems can be worked out with individual firms on a confidential basis using the facilities of these colleges. The Ministry also is experimenting with using government laboratories as industrial consultants. The Atomic Energy Authority has pioneered this. It works on the technology of desalting, both distillation and other techniques such as freezing. Harwell offers a consulting service to develop advanced techniques of nondestructive testing.

The Ministry encourages firms in other ways too. By agreeing to buy first-run models it sparks advanced development programs. Now it is beginning to place development contracts with individual companies.

Tough-minded selectivity gives this approach bite. In both the Harwell-type consulting and in placing contracts, the Ministry picks its industrial partners. It wants to encourage progressive management attitudes and, where firms are too small to be technically efficient, to encourage growth through mergers. By implication, it wants to force managements to modernize or die.

Anthony Wedgwood Benn, Minister of Technology, says frankly that some firms will be hurt: "There is a revolution going on that will burn down a lot of the old forest so that new trees can be planted."

It will take years to see if this will be a really effective revolution. Certainly, I ran into much pessimism, much skepticism as to whether anything vital would come of it. Yet Benn himself is an optimist. He is in charge of a new ministry where he can experiment without the dead weight of precedents. He finds wide co-operation within industry. Citing this, he says that "of all the world's countries, Britain, for me, right now is probably the most exciting one in which I could work."

Robert C. Cowen, '49, is Science Editor of The Christian Science Monitor.

Book Review

The Invisible Machine

Every generation tends to interpret the past in its own image and then justify the self-evaluation by its version of history. Ours is no exception. Few would dispute the accepted view that the machine is at the center of human life in the Twentieth Century, and that this condition is the direct consequence, not only of the technological expansion that began in a modest way about 200 years ago, but of the biological and social evolution of the first primitive individual who could be considered Homo sapiens. In fact, the quality that distinguishes him from other animals—the most charac-teristically human quality which links him to modern man-is the making and use of tools and machines. Man is really Homo faber not Homo sapiens, the maker not the knower and discerner.

Furthermore, few would doubt the proposition, to which history lends support, that continued technological expansion is inevitable, and that society must seek solutions to its problems in technology itself. That the proposition is widely accepted is evident, for example, in approaches to improving the present unhappy state of American education through the development of a new philosophy—and a new industry—based on the "technology of education."

From at least 1934, when *Technics and Civilization* was published, Lewis Mumford, Visiting Professor at M.I.T., 1957-1960, has doubted and disputed accepted views, while developing his own on the relation of technology to human life. He continues his highly individual investigations in his newest book, *The Myth of the Machine* (Harcourt, New York, 342 pp., \$8.95).

Almost everyone will disagree with something in the book, if only because there is so much in it. It doesn't matter. Mr. Mumford scatters ideas like sparks from a Fourth-of-July sparkler, more than enough for a season of thought and further reading.

I do not mean to imply that Mr. Mumford is an old curmudgeon. He is a responsible scholar with properly selective criteria. When he disagrees, it is always clear why, and it is generally with representatives of two classes: those who determine contemporary policies and those who interpret past events—that is, those who make history and those who write it.

He is concerned chiefly with the prevalent self-fulfilling concepts about the nature and origin of man and human culture, especially the stultifying belief that early man was essentially a toolmaking animal. In this view, invention came to have meaning only in relation to tools, for stone endures, while the belief itself inhibited consideration of the possibility of nonmaterial inventions, such as language, art, dance, song, ritual. Yet the Australian Bushmen have these, though their tools are rudimentary. So strong was the conviction of the primacy of stone tools in evolution that when the first paleolithic cave paintings were discovered in Spain in 1879, they were indignantly rejected as an outright hoax, since Ice Age hunters could not possibly have had the capacity to produce such elegant art.

It is precisely these inventions—language, art, song, ritual—that are characteristic of *Homo sapiens*, Mr. Mumford asserts. A stone axe is a fact. On what basis can such an assertion be supported? Some uneasiness is suggested by statements like "This interpretation of early man's behavior does not, I must point out, rest on pure conjecture," and "It is not sheer guesswork, but a highly probable inference, to suggest that . . ."

Facts in history, like facts in science, are not very useful if we play safe. If we expect the study of history to shed some light on how we arrived here and now from there and then, we must be prepared to go from whatever facts are available to reasonable inferences and perhaps, on occasion, to speculation.

"If the only clue to Shakespeare's achievement as a dramatist were his cradle, an Elizabethan mug, his lower jaw, and a few rotted planks from the Globe Theatre, one could not even dimly imagine the subject matter of his plays, still less guess in one's wildest moments what a poet he was... we should... have a better notion of his work through examining the known plays of Shaw and Yeats and reading backward."

The contemporary view of the machine and technology, against which Mr. Mumford argues, is a myth resting upon another invention that originated in early neolithic (or perhaps paleolithic) times. It can best be described by considering one of Mr. Mumford's examples, the Great Pyramid at Giza, built almost 5,000 years ago.

The pyramid, 481.5 feet high and 755 feet square at the base, has an inner chamber, where the body of the Pharaoh lay, covered by a single stone slab weighing 50 tons. The stone blocks of the pyramid were quarried, transported,

lifted and set in place using only the inclined plane and lever (the wheel, the pulley and the screw were not yet known). The significant invention was not the pyramid, but the high-power, high-precision machine with which it was built—a machine the components of which were human beings, with an estimated total output of 25,000 to 100,000 man-power.

No play on words is intended, and there is none, if we accept the conventional definition of a machine as a combination of interrelated parts with specialized functions, using energy and performing work. The parts were men, but men reduced to the barest elements, obedient bone and muscle, without mind or will, and the tasks were subdivided into minute specialties. Mr. Mumford designates this archetypal form by more than one name: the labor machine or military machine, depending on how it was used; in its totality, the megamachine; and when attention was on the components, separate in space, but integrated into a single social organization . . . the invisible machine.

The megamachine was the working model for all subsequent complex machines, the human components being replaced in the course of time by more reliable mechanical parts.

But this machine was itself the product of another social invention—divine kingship—and inseparable from it. Only the king, ruling by divine right, could turn a collection of human beings, each with a will and memory into a mechanized group that obeyed commands. The invisible machine worked and survived because it was not only coercive and destructive, but also life-promoting and constructive, multiplying space, time, and energy to build roads, produce and store food surpluses, create cities.

Mr. Mumford presents a mass of detail to support his deductions and generalizations. I found the facts enlightening, his reasoning plausible and his conclusions useful, though I hesitate to enter into an examination of their "truth" or even of the meaning of truth in a study such as his.

As the divinity of the king's power was mythical, so there was a corresponding myth associated with the machine he called into being.

"The one lasting contribution of the megamachine was the myth of the machine itself: the notion that this machine

was, by its very nature, absolutely irresistible—and yet, provided one did not oppose it, ultimately beneficent. That magical spell still enthralls both the controllers and the mass victims of the megamachine today."

The machine, in whatever form, is not the center of human life today; man himself always has been and still is the central reality. To continue to base social action on hope or fear of technology denies this reality and perpetuates a myth. The handwriting on the wall, Mr. Mumford may be saying, is only a forgery.

In Brief

The Human Skull: A Cultural History (Praeger, New York, 168 pp., \$7.95) is described by its author, Folke Henschen, a Swedish pathologist specializing in the cranium and the brain, as "an album of notes on journeys into some of the peripheral zones of medicine." Peripheral indeed, and fascinating! He treats of abnormalities of skull size and shape (When Erasmus sat for the Holbein portrait, was the large biretta he wore padded to conceal his small head?); the skull in prehistory; the skull as symbol of death, as relic, as warning; trepanation; phrenology; the skull in art; and finally, the fate of famous crania (including those of Saint Bridget, Descartes, Swedenborg, Voltaire and Haydn) lost or stolen, and sometimes happily reunited "with the rest of their mortal remains."

One of the fertile offshoots of the Physical Science Study Committee program for high school physics is the Science Study Series of books intended for the lay public, as well as students. From Raindrops to Volcanoes: Adventures with Sea Surface Meteorology (Doubleday, New York, 180 pp., \$4.95, paper \$1.95) by Duncan C. Blanchard, Ph.D. '61, shares with other books in the series an appropriately oblique approach to familiar subjects. Simply and clearly, Dr. Blanchard describes what he learned from his research on raindrops, bubbles in the sea, and the role of volcanoes (including one newly born off Iceland) in the formation of clouds, throwing interesting sidelights on the conventional aspects of meteorology.

In 1951, Peter Crowcroft, an Australian zoologist, undertook "a bit of research" on mice, which were destroying grain in Britain's strategic food stocks. Belatedly, he has written an account of his studies, Mice All Over (Dufour, Chester Springs, Pa., 121 pp., \$5.00). It is firstrate scientific reporting, engagingly personal and fresh-despite the chapter epigraphs from Of Mice and Men. Dr. Crowcroft studied the feeding, breeding, and social behavior of mice in mouse paradises with abundant food and space and in hungry, overcrowded slums. He describes his observations in detail, but leaves to the reader any extrapolation beyond mice, only once indicating his own reaction. " . . . The more I observed mice, the more I came to recognize elements of the behavior of my fellow

men, and the more I began to understand both species... There is something terribly familiar about the awful situation of a mouse in the world."

New From the M.I.T. Community
Silver: Economics, Metallurgy, and Use,
Allison Butts, '13, Editor, with the collaboration of Charles D. Coxe. Princeton,
N.J., London, and Toronto: D. Van
Nostrand Co., Inc., \$17.50. The story of a
single metal on which civilization has
depended for most of recorded history,
this book is at once a history of metallurgy, a summary of monetary economics,
as well as a treatise on art and jewelry,
and a review of modern materials science.

On Modernism: The Prospects for Literature and Freedom, Louis Kampf, Associate Professor of Literature. Cambridge and London: M.I.T. Press, \$10. A humanist's view of currents of thought inherent in modern art, psychology, and philosophy, attempting a modern intellectual response to artistic and social problems.

The Study of Total Societies, Samuel Z. Klausner, Editor. Garden City, N.Y.: Anchor Books (Doubleday & Co., Inc.), \$1.25. Ithiel D. Pool, Professor of Political Science, has provided a chapter on "Computer Simulations of Total Societies," illustrated with several examples of simulations.

Essays on the Theory of Optimal Economic Growth, Karl Shell, Associate Professor of Economics, Editor. Cambridge and London: M.I.T. Press, \$12.50. Fifteen essays based upon material presented at a 1965-66 M.I.T. seminar on the theory of optimal economic growth, published for their significance to students of economic theory, planning and development, growth theory, mathematical economics, and macroeconomics. Contributors include the editor; George A. Akerlof, Ph.D. '66; Pranab K. Bardhan, Assistant Professor of Economics; Mrinal Datta-Chaudhuri, Ph.D. '66; Paul A. Samuelson, Professor of Economics; and Eytan Sheshinski, Ph.D. '66.

Films and Feelings, Raymond Durgnat. Cambridge: M.I.T. Press, \$6.95. An examination of many classic and modern films in an effort to establish a genuine aesthetic of the movies.

Tom Rivers—Reflections on a Life in Medicine and Science, Saul Benison. Cambridge and London: M.I.T. Press, \$17.50. An autobiography of Dr. Thomas M. Rivers of the Rockefeller Institute for Medical Research, a pioneer in the field of virology, achieved through the medium of tape recordings edited by Mr. Benison.

The Statistical Theory of Non-Equilibrium Processes in a Plasma, Y. L. Klimontovich. Cambridge: M.I.T. Press, \$12.50. An English translation from the Russian of lectures read in the Mechanics and Mathematics Faculty of the Moscow State University.

Electrodynamics of Moving Media, Paul L. Penfield, Jr., Sc.D. '60, Associate Professor of Electrical Engineering, and Hermann A. Haus, Sc.D. '54, Professor of Electrical Engineering. Cambridge: M.I.T. Press, \$12.50. A research monograph based on work in the M.I.T. Research Laboratory of Electronics resolving several different mathematical formulations for moving media, originally prepared as notes for a graduate course.

Models for the Perception of Speech and Visual Form, Weiant Wathen-Dunn, Editor. Cambridge and London: M.I.T. Press, \$10. Fifty-three papers dealing with the general principles of organization that underlie perception as a whole, presented at a symposium on the topic sponsored in 1964 by the Data Sciences Laboratory of the Air Force Cambridge Research Laboratories.

Cuba: Castroism and Communism, 1959-1966, Andres Suarez. Cambridge and London: M.I.T. Press, \$7.50. A survey of events in Cuba from the beginning of the Castro revolution to the mid-1960's; prefatory note by William E. Griffith, Ford Professor of Political Science, and foreword by Ernst Halperin, Research Associate in Communist Studies, M.I.T. Center for International Studies.

Science Is Not Enough, Vannevar Bush, '16, Honorary Chairman of the Corporation. New York: William Morrow & Co., Inc., \$4.50. A collection of essays, some previously published elsewhere, concerning the relationship of scientific ideas to human affairs ranging from management and aesthetics to baseball.

The Origins of Modern Town Planning, Leonardo Benevolo. Cambridge: M.I.T. Press, \$5.50. The ideological and technical origins of town planning—always applied as a remedy after the event, for a situation already out of hand.

The Army of the Republic—The Place of the Military in the Political Evolution of France, 1871-1914, David B. Ralston, Associate Professor of History, M.I.T. Cambridge and London: M.I.T. Press, \$12.50. How a large army and the Third Republic lived together to provide France with political and social stability.

Electronic Digital Systems, Richard K. Richards, Ph.D. '49. New York: John Wiley & Sons, Inc., \$15. The over-all functioning of a digital machine and the characteristics common to all digital computers.

General Virology (second edition), Salvador E. Luria, Sedgwick Professor of Biology, M.I.T., and J. E. Darnell, Albert Einstein College of Medicine. New York: John Wiley & Sons, \$12.50. Text-book on virology as an independent experimental biological science, giving a composite picture of the operation of viruses as genetic and biochemical entities.

Dr. Joseph Mindel is a member of the M.I.T. Lincoln Laboratory.

Success never eluded Charlie Spear but his most lasting satisfaction has come from his association with New England Life.

Charlie was president of his class at Northeastern University, played on the hockey team and was an outstanding student of mechanical engineering. As a sales engineer, first with Allis-Chalmers and then with Mobil, he had become a sales supervisor of a seven-state territory when he resigned to join New England Life.

"Although I had been on the escalators of promotion, it took this business and its professional

sales approach for me to find real career satisfaction," is the way Charlie sums it up.

When he made his move he was 38 with a wife and 5 small children, and was living far from his home city of Boston. He continues to live and thrive in Wausau, Wisconsin, and gives testimony to the fact that a

mony to the fact that a man can make his own way in this business, and on his own terms. Working 200 miles from his general agency in Milwaukee, Charlie Spear is especially appreciative of the cooperation he has gotten from his Company and his general agent in giving him the preparation and backing to offer the kind of service

to businessmen that could meet his high standards.

New England Mutual Life Insurance Company, Home Office: 501 Boylston St., Boston, Mass. 02117

Charles G. Spear, C.L.U. (right) talks with client David Graebel (left) who operates a major Midwest moving firm.

GIARDIA MOVERS

MOVERS

MAGEN ... ALLIED VAN LINES, INC.

WAUS APPLE

MILWAU

The following MASSACHUSETTS INSTITUTE OF TECHNOLOGY Alumni are New England Life Agents:

Stanley W. Brown, '36, South Hadley

Arthur C. Kenison, '19, Boston

Here in the hills of East Tennessee we are known as | Eastman and the atmosphere is sort of different



Ladies' picnic on a Thursday afternoon in Warrior's Path State Park near Kingsport, Tenn. Down in the valley the chemical engineering is as up to date as any on earth, but the tensions of the big cities seem slow to penetrate the hills of East Tennessee. Some call this isolation and like it. Some wouldn't. We offer choice,

You may have first heard of Kodak when you were eight years old and grandpa pointed a camera at you. In Kingsport, Tenn., Longview, Tex., and Columbia, S.C., there are 15,000 of us who make no cameras and no photographic film but turn out fibers, plastics, and chemical ingredients for a hundred other industries. In fact, we can offer no less a variety of chemical engineering opportunities in those communities than in Rochester, N.Y., where we produce our renowned photographic goods for enjoyment, for business, for education, and for the professions.

Although many Kodak chemical engineers eventually move into production or management functions, none start there. First assignments are in development and process improvement, or systems and research. A chemical engineer might also make full use of his professional competence in liaison with our customer companies, in which case he is in marketing and had better count on moving around quite a bit. Otherwise we are so set up that we can give an engineer all the opportunity for advancement he wants without ever asking him to change communities.

We make the same promise to mechanical, electrical, and industrial engineers, by the way.

Drop a note about yourself to Business and Technical Personnel Department, Eastman Kodak Company, Rochester, N.Y. 14650. If you have any geographical preferences or any other category of preferences in work, mention them. We are an equal-opportunity employer.

And here, just to be specific, are what occupy the chemical engineers down in the valley:

RATHER SPECIAL

Solid-phase polymerization

High-temperature vapor-phase pyrolysis

Liquid-phase air oxidations

Non-Newtonian flow

Drying of tacky pastes

Extrusion of hot, viscous, temperaturesensitive materials

Design of systems for melt- and solvent-spinning

Oxidation of ethylene to acetaldehyde and ethylene oxide

Oxo process

Olefin polymerization

Vapor-phase dehydrogenation

MORE GENERAL

Design of pilot plant and plant equipment from laboratory data and basic chemical engineering unit operations

Drying operations for fibers, plastics, and chemicals

Viscous flow and heat transfer

Chemical kinetics rate models

Dispersion systems

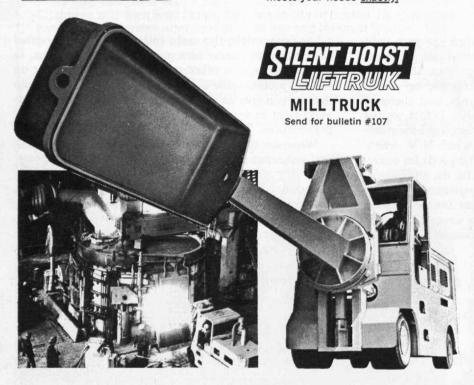
Mixing studies

Use of computer hardware and software in plate-to-plate distillation program, hydraulic design, heat-exchanger design, mass transfer equipment design, reaction simulation

Kodak

Only Silent Hoist makes the machines that match your job exactly.

This special SILENT HOIST Mill Truck for furnace charging is one example. Starting with a standard SILENT HOIST 30,000 lb. mill truck, SILENT HOIST engineers custom designed it for this special furnace-charging application. The result was a machine incorporating the finest quality components, designed for dependable high-cycle performance under extremely adverse conditions. The fully enclosed, dust and dirt-free apron rotator includes positive hydraulic gear drive and heavy-duty roller bearing support . . . rugged high-performance design features typical of SILENT HOIST equipment. Standard and custom designed SILENT HOIST Mill Trucks are now in use by America's leading corporations. When considering heavy-duty material handling equipment, let SILENT HOIST give you complete information on the standard or custom designed machine that meets your needs exactly.



Standard SILENT HOIST MILL TRUCKS are available in standup and sitdown models with rams or fork tines. Ten models from 10,000 lbs. to 100,000 lbs. capacity all feature planetary axle, automatic transmission, power steering, short turning radius and narrow width. Gasoline, diesel or LPG power is available.

SILENT HOIST & CRANE CO.

Pioneer manufacturers of heavy-duty materials handling equipment.

Brooklyn, New York 11220



3 tons to 50 tons Bulletin #100 LIFT-O-KRANE Bulletin #105 KRANE KAR 180° and 360° swing Bulletin #79 MILL TRUCK Bulletin #107

STRAD-KRANE Bulletin ST

W. J. BARNEY CORP.

Canada Dry Corporation, Queens, N.Y.

50 YEARS EXPERIENCE

. . . and then some.

Just recently we passed our 50th Anniversary.

Our management and other key personnel also represent a combined total of hundreds of years of on-the-job experience with our organization.

This know-how, plus careful advance planning and constant inspection as the work proceeds, results in speedy completions with accompanying economy.

W. J. BARNEY CORPORATION
Founded 1917
INDUSTRIAL CONSTRUCTION
101 Park Avenue, New York
Alfred T. Glassett, '20, President
Robert F. Lathlaen, '46, Vice President

KULITE

METALLURGY

Tungsten, molybdenum, cobalt, special alloys — fabrications. "HI-DENS" tungsten alloys — for counterweights and shielding.

SOLID STATE SENSORS

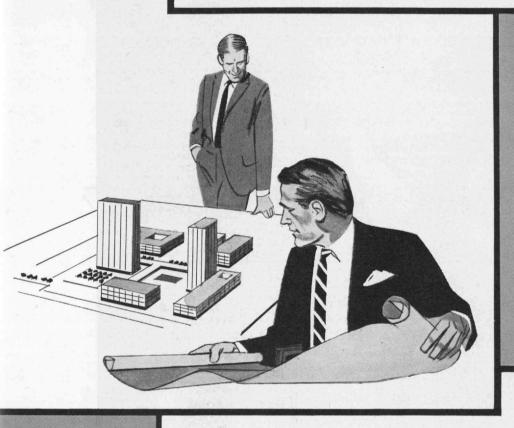
Semiconductor strain gages, integral silicon force sensors and temperature sensors for measurement and control applications.

Anthony D. Kurtz, 1951 Ronald A. Kurtz, 1954

KULITE

(Kulite Semiconductor Products, Inc., Kulite Tungsten Co., Inc.) 1030 Hoyt Avenue, Ridgefield, N. J.

An Estate in the Making



The personal fortunes we know best are those we are helping to create—this young corporate executive, as an example, has turned to the Trust Company for assistance.

He has unusual ability and has advanced so rapidly in his company that he is certain to be in the top management group. His executive compensation is already substantial.

His investments are taking too much of his time, so he has turned them over to us to manage. His growth pattern calls for a larger home, or one differently located; we will help to finance it.

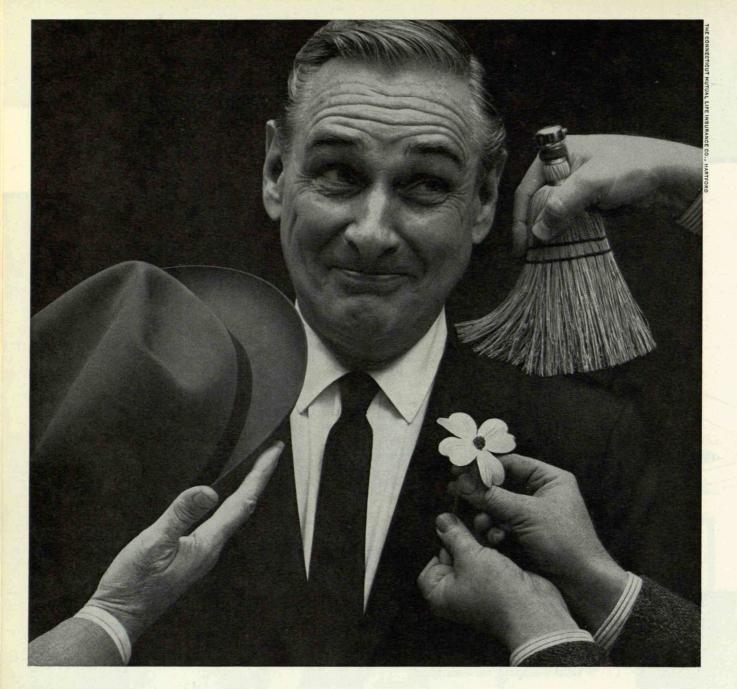
For various reasons that include financing stock options, he would like to combine his loans here and borrow considerably more—to which he is amply entitled.

We think this executive will go a long way and we intend to go the full distance with him—and his family.

United States Trust Company

OF NEW YORK

45 Wall Street • Telephone 212-425-4500



We also gave him a raise

Policyholders get special treatment from Connecticut
Mutual—and good dividends too! This year, we again raised
their dividends thus reducing the cost of their

life insurance. It's the twelfth dividend increase in the last 20 years. Another reason why this 121-year-old firm is called the 'Blue Chip' company.

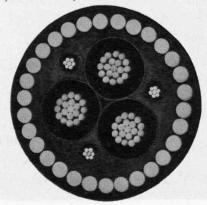
Connecticut Mutual Life

Your fellow-alumni now with CML
Richard E. Boraks '59 (XXII) Hartford
Ralph Mendel '38 (V) New York

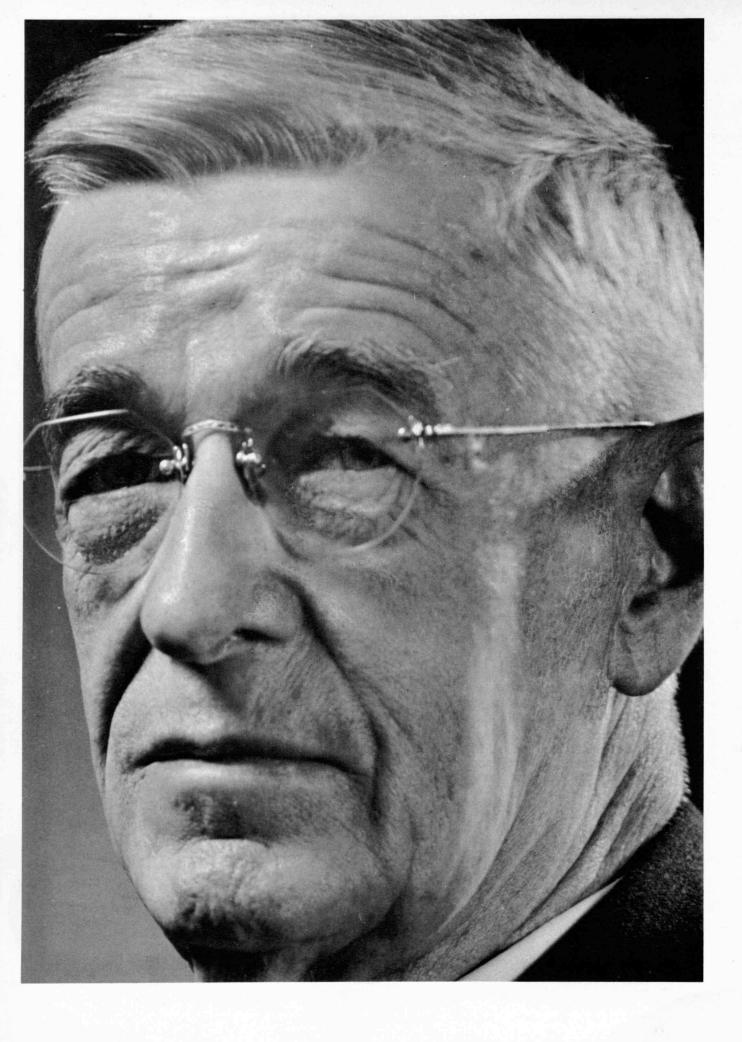


This is a nest of grouse eggs. A nest is a fragile concatenation of twigs, built by a delicate creature with no hands, but it is built to do a job, and it does that job to perfection. Within one classic circle, a nest is a home, a bed, and a protective shelter.

Below is a "plan" of a Kerite cable. Cables may look alike in cross-section, but a Kerite cable is as different from other cables as a nest is from random twigs. Kerite is built to do its job to perfection. Only the right combination of proved materials, engineering, experience, and technique makes it possible. The Kerite Company, 30 Church Street, New York, N. Y. 10007.







Though science has vastly broadened our knowledge and power, the ultimate truths remain beyond man's comprehension

The Search for Understanding

In these fifty past years we have seen an unparalleled advance of science. But we have seen much more. We have seen two great wars. We have seen a depression such that its repetition would shake the foundations of the republic. We have seen the splitting of the world into two armed camps, two philosophies, and two ways of life: on the one hand an oriental despotism in its modern form, and on the other hand a free world. We have even seen what may be the beginning of world order.

Science has had a part in the development of the form of the present schism. And I am not referring merely to the fact that science has made possible the A-bomb and the H-bomb. I am referring to something more fundamental, for political movements reflect the philosophy of peoples, and many old anchors have been torn loose since the turn of the century. Science has had much to do with this, for the way in which science has itself evolved has influenced our patterns of thought, our philosophy, and thus our political institutions.

Physics, once seeing a universe made up entirely of two simple particles, now has fifty. Its energy comes in discrete packages or quanta. The indeterminacy principle puts a limit to the knowable within its own domain. For most physicists, theory has become a convenience only. Physics does not mind having two entirely separate theories of light, quite contradictory when taken in their elements but both useful. James Bryant Conant defines science as merely "a series of inter-connected concepts and conceptual schemes arising from experiment and observation and fruitful of further experiments and observations."

If hypotheses are merely convenient tools, they may well be made convenient for other purposes than being guides to further experiment; they may be convenient for the state. In the U.S.S.R. scientists were long directed, in the interests of the state, to follow Lamarck and not Darwin. More important, a materialism on a scientific base encouraged a lust for conquest and an intractability in all international relations. There is danger in the intense emphasis upon science today, and upon the acceptance only of convenient and temporary working hypotheses; for this only too often carries with it an implied denial of any ultimate truth. We are likely to forget that an attitude, sound enough for the purposes of physics in its present state, may not be generalized without implying exceedingly broad assumptions. We are likely to forget, also, that we pursue science for other reasons than its mere utility. From a complete absorption in pragmatic science it is a short step, indeed, to full dialectical materialism—to a denial of all religion—to a denial of all virtue except that of strength.

Bertrand Russell wrote this as our century was getting under way: "That man is the product of causes which had no prevision of the end they were achieving; that his origin, his growth, his hopes and fears, his loves and his beliefs, are but the outcome of accidental collocations of atoms; that no fire, no heroism, no intensity of thought and feeling, can preserve an individual life beyond the grave; that all the labors of the ages, all the devotion, all the inspiration, all the noonday brightness of human genius, are destined to extinction in the vast death of the solar system, and that the whole temple of man's achievement must inevitably be buried beneath the debris of a universe in ruins—all these things, if not quite beyond dispute, are yet so nearly certain, that no philosophy which rejects them can hope to stand."

This is the extreme view. Man, as he learns a little, is only too prone to believe that now he can know

all or that he can know nothing. To separate scientific theory from our pondering on spiritual values is indeed sound practice. But to deny that there is any validity beyond the findings of science is absurd. In the realm of spiritual values we think more deeply today, even if perhaps no more soundly, because science has built a new conception of the cosmos by its measurements and its analyses.

This is a difficult world in which we live today, and scientific men do well to ponder their part in influencing the way in which we now proceed. But I believe that the extreme materialistic view is held mostly by those who become intoxicated by a bit of a grasp of material things. To pursue science is not to disparage the things of the spirit. In fact, to pursue science rightly is to furnish a framework on which the spirit may rise.

Fear is not new in the world, nor the problem of evil. The rabbit that crouches as the owl swoops knows terror, and the mother partridge dragging a wing to lure the invader from her chicks does so with a wildly beating heart. And that which is evil to the duck on her nest is good for the fox pups saved from starving. There are life and beauty in the world, but fear and evil are with them, for that is how the world was formed. And man, who gives these things names, wonders at his lot, and is baffled and confused.

There was no compassion in the world until man brought it. Nor was there beauty or virtue until he thought it so. His values do not all derive from his will to live, or from the sifting of selection.

That a man will devote his life to the good of his fellows is not always a product of evolution, or self-seeking that is sublimated. Altruism is a product of his mind, not of his seamy history.

So too is his will to know. His yearning to understand reaches far beyond the control of nature for his bodily well-being. The shepherd on the hill at night views the stars and ponders, not that he can thus care better for his sheep, not just that he is idle and his mind roams, but because he wonders whether, beyond the stars, lies the reason why he can thus ponder.

The search for knowledge has always been under stress. The old geometer, manipulating his triangles in a quest for release from his perplexity, was never far from a barbarian and his spear. The shadow of the guillotine fell across the pages on which France recorded some of its most profound science. No man delves into the unknown who is not under sentence of death. The greatest work of man, a brain trained through the years to deal in wisdom, is destroyed in a moment by chance or malice. The inherited knowledge of the years endures, passed on and accumulated, but even that ends if free men fail.

A plane flies overhead on its peaceful mission. But it may some day be a plane which carries destruction such as the world has not yet seen. The edifices of the city may be consumed in a moment, and with them the edifices of the mind. The threat is very real.

It is well that we should band together in the resolve that the deadly plane shall not fly. It is even well that we should strive to ensure that, if it does, we shall still endure. The duty and the opportunity to struggle to preserve our lives, and our way of life, are not canceled just because the form of the threat has changed.

Do we exist just so that we can struggle to continue to exist? Or is there more to life than that?

We understand so little, the universe is so great and so intricate, and beyond it lie things that we may never know. Is there real significance when man can observe a distortion of a galaxy which occurred long before dinosaurs roamed the swamps, or create a painting which conveys far more than is ever seen by the eye? Is all our ordering of what we think we know merely a fleeting guide to further search? Is there no real value in searching except to use? We, who think, are dedicated to the search for knowledge. Are we thus dedicated also to a search for truth? Has the word any meaning beyond convenience?

Because we must fail fully to understand, should we refuse to watch the galaxies as they seem to rush away toward oblivion? Should we probe toward the core of the earth only if it will help us find new ore? Does man speculate about his origin and his destiny merely because his mind devel-

oped the capacity to wonder as an incident to its capacity to help him compete, much as a toucan grew a fantastic bill as a chance product of genes that became combined for useful ends?

Does the mystery of our conscious thought lead us toward a greater mystery, beyond our feeble definition in terms of the marks on rules, or the ticking of a clock, which we cannot understand but which we cannot deny? Are we thus a part of something more profound than the knowledge we gain by the movement of needles on dials, or the tipping of a balance? Is there meaning in life beyond mere animal existence?

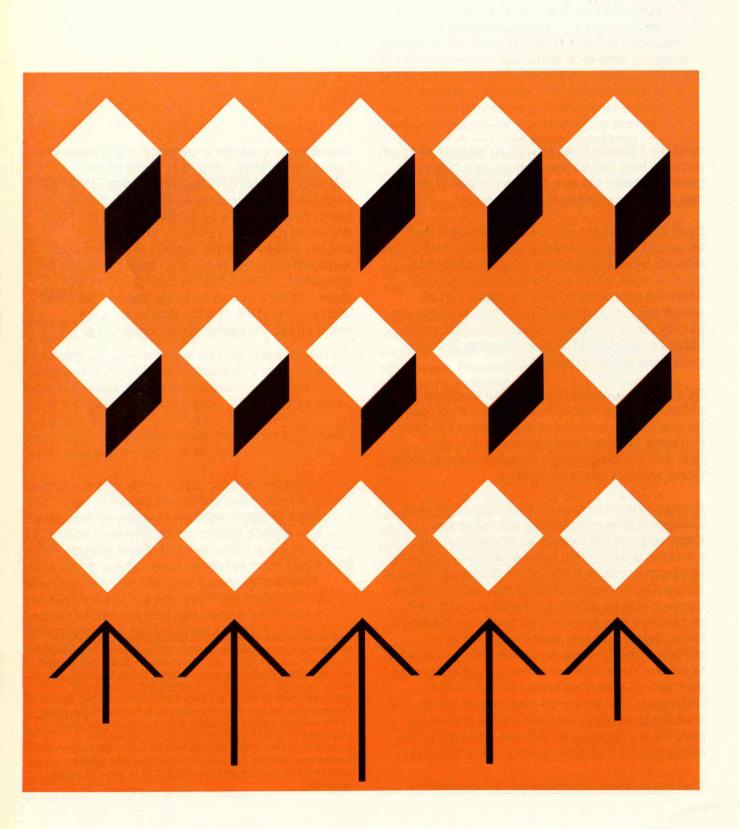
Science has a simple faith, which transcends utility. Nearly all men of science, all men of learning for that matter, and men of simple ways too, have it in some form and in some degree. It is the faith that it is the privilege of man to learn to understand, and that this is his mission.

If we abandon that mission under stress we shall abandon it forever, for stress will not cease. Knowledge for the sake of understanding, not merely to prevail—that is the essence of our being. None can define its limits, or set its ultimate boundaries. Our children's children may weight it more than we, may be able to lift the curtain just a bit, and believe they know why all this is so. We would leave them a heritage, even though we live in perilous days. Thus we would continue to delve and to ponder, even while we strive to keep the bombs from falling, even if we know that the bombs will fall and that the things we love may perish. For if we fail to struggle, and fail to think beyond our petty lot, we accept a sordid role. The light in our minds tells us that there is more to life than this.

That the threat is now intense is not a reason to

abandon our quest for knowledge. It is a reason to hold it more tightly, in spite of the need for action to preserve our freedom, in spite of the distractions of living in turmoil, that it may not be lost or brushed aside by the demands of the hour. We would not neglect our duty to our country and our fellows to strive mightily to preserve our ways and our lives. There is an added duty, not inconsistent, not less. It is the duty to so live that there may be a reason for living, beyond the mere mechanisms of life. It is the duty to carry on, under stress, the search for understanding.

This essay is one of 10 in Dr. Bush's new book, Science Is Not Enough, published on October 25 by William Morrow and Company, Inc. (\$4.50) © 1967 by Vannevar Bush; it is printed in Technology Review by permission of the publishers and of the Carnegie Institution of Washington, where it was first presented. Dr. Bush is Honorary Chairman of the M.I.T. Corporation. He was Vice President and Dean of Engineering at the Institute before becoming President of the Carnegie Institution of Washington in 1939; during World War II, as Director of the Office of Scientific Research and Development, he was the principal architect of a new relationship between science and government in support of national needs.



Companies can now move toward a cause-andeffect relationship between personnel policies and needs

Human Resources for Enterprise Management

The contribution of the social sciences to the present practice of management seems to me disappointingly small. It is true that in the past 15 years there have been perhaps 150 books and 1500 articles written on the subject. And yet the practice of management remains almost the same. To be sure, managerial vocabulary has changed. The well-rounded manager now speaks of T-groups, cognitive dissonance, and role conflicts, but he does just about the same things he has always done. The social scientist, on the other hand, has made his field tremendously larger and more complex, but, in general, he has taken on very few of the manager's pressing problems. We are in danger of realizing a situation in which the two groups talk to themselves but not to one another—a complicated gavotte endlessly circling but never making contact. Why is this so?

One of the reasons has been the tendency of the behavioral sciences to approach the management problem with a bit of this and a piece of that. Instead of facing the whole of the organizational problem, we have been seduced by the apparent relevance of psychological concepts to particular problems.

Instead of directing ourselves to the broad organizational issues, it seems to me that the social scientists raised the issues that seemed relevant to social science. The things that were done were those that were cute, superficially relevant, and had a short-term payoff. In the face of this, the manager was often intrigued, or even convinced, but it was hard for him to know how to use the contributions because it was hard for him to see just how they applied and toward what end their main thrust was directed.

We have been bemused with short-term productivity. As we look at a history of success stories of social science research in industry, the argument is typically from short-term success, although the main thrust is elsewhere. The same thing seems to stand out from a recital of all the classic experiments: we have fallen into the trap of trying to win friends by demonstrating short-term productivity. In the proc-

ess we have missed the larger essential organizational problems to which the social sciences are relevant. What kind of integrated approach will supplant the "bits and pieces" and what general objectives will override short-term productivity?

Before we answer these questions, let us look a little at managerial practices. For I would argue that an exactly parallel course has occurred here: management has largely ignored the clearly present but very complex long-term criterion on the one hand, and, on the other, has operated in the most disparate bits-and-pieces manner possible with respect to the management of human resources. Consider the situation. It is clear that in any organization there are at least two tasks with respect to the people. We must deploy them and support them technologically, to optimize present productivity. At the same time we must operate in such a way as to guarantee future manpower needs. Such needs can be budgeted at least as well as capital needs: We shall need, say, one new president every 10 years. We shall need five new vice presidents every 10 years; they must be able to perform the present vicepresidential tasks well and also provide the pool from which the president will be drawn. We shall need 20 new general managers every 10 years, and they must meet the same demands as the vice presidents. Any organization can fill in the correct numbers, with a margin of error, and specify the two criteria-present productivity and future promotability-for each need at each time.

Very few organizations face the problems of managing their human resources as squarely as this. We have a tradition of planning expansion in terms of market growth, product diversification, and capital availability, trusting that the flexibility of people and a loose labor market will protect us from the results of not planning in the human area. We have not, in general, taken responsibility for what is, from the side of the organization, manpower planning or what is, from the side of the individual, career development.

The Variables to Change Behavior

Every company controls a portfolio of the most powerful tools for changing the behavior of its employees. Pay, promotion, training, job rotation or cross-functional assignment, performance evaluation, supervision—all of these are immensely strong levers to modify behavior. They can usefully be thought of, in organizational terms, as variable inputs which management can apply at its discretion to shape the manpower pool for present productivity and future promotability. Or, on the other hand, they can be viewed as optional interventions in the career development process. In either case, they are the company's repertoire of potential actions to attack the problem of human resources.

In using these weapons, I would argue that the company has been guilty of exactly the same two errors as the social scientist: committing its resources piecemeal, and focusing too narrowly on a short-term criterion. Most companies do a little training, a little worrying about the effect of the compensation plan, and a lot of supervisory exhortation, but I know of none that treats the optional interventions as an integrated whole. I have never seen a case where a company was prepared to say, "If we change our compensation plan in this manner we will have to change our supervisory practices, modify our techniques for controlling turnover, and reshape our training to meet the changed conditions."

We do not treat them as an integrated whole because we do not know how to do so—we have never faced squarely the questions of what any of the changes does or how such changes affect one another. We have not generally dealt with the discretionary possibilities as an integrated system of which the parts are interacting with one another and differentially related to the various goals of the organization.

For example, cross-functional assignment is presumably designed to improve future promotability, even though it is probably at the expense of present productivity. I have never seen an attempt to assess the cost in productivity or to demonstrate the hypothetically attendant benefit to promotability. If a man is assigned to a new function to improve his promotability, do we adjust our other mechanisms to this? Does he receive an incentive bonus for doing less well than other people at the same job because we know he is doing well considering the fact that he was deliberately stretched beyond his specialty? Does his performance evaluation give him a pat on the back and say, "Congratulations. You're doing poorly. It's a wonder you're not doing worse."?

It is time we stated the system explicitly, time we treated explicitly the multiple objectives with respect to human resources and the degree to which each of the treatments affects the outcomes as well as the way in which they interact with one another. It is technologically possible to do this now. We have the concepts, instruments, and hardware to do it. We need the will to treat the whole system in an integrated way. We need to do for the management of human resources what the general adoption of budget procedures did for manufacturing processes some years ago.

Many companies are planning expansion and diversification, but these changes will have to be accomplished in the face of a reduced pool of management manpower. We know, for example, that in the 1970's there will be a million less men age 35 to 45 than there are today—a reduction of about 8 per cent.

An Integrated Model of Goals and Treatments

What events can change the effectiveness of people in organizations? There are, fortunately, only a small number:

- 1. New people move into the organization.
- 2. Some people move out of it.
- 3. Some people move up in the organization.
- 4. Some people move sideways.
- 5. Some people change their behavior.

I would like to argue that these are the only alternatives that can happen to people in an organization. Using these five variables, management has to do today's job and provide for the future.

The tools management uses to change the effectiveness of people, though immensely powerful and diverse in their specifics, are also relatively few:

- 1. Recruitment
- 2. Selection and classification
- 3. Training
- 4. Supervision
- 5. Job assignment
- 6. Performance evaluation
- 7. Pay
- 8. Promotion

This matrix of goals and treatments attempts to suggest their interrelationships. The values have been assigned arbitrarily, and better numbers could perhaps be supplied. What they mean, for instance, is that recruitment has a primary effect on who moves in, and is given a value of one. On the other hand, it only has an indirect effect on the character of those moving up, or on their change, and is given a lower weight of three. Training, on the other hand, has little to do with who comes in, and gets a five, but a lot to do with who changes, and gets a one there.

	Moving In	Moving Out	Moving Up	Moving Over	Changing	Total		
Recruitment	1	3	3	3	3	13		
Selection and Classification	1	3	3	3	3	13		
Training	5	2	2	2	1	12		
Supervision	4	1	1	1	1	8		
Assignment	3	1	1	1	2	8		
Performance Evaluation	5	2	2	2	2	13		
Pay	2	2	3	4	4	15		
Promotion	2	1	1	1	3	8		
Total	23	15	16	17	19			

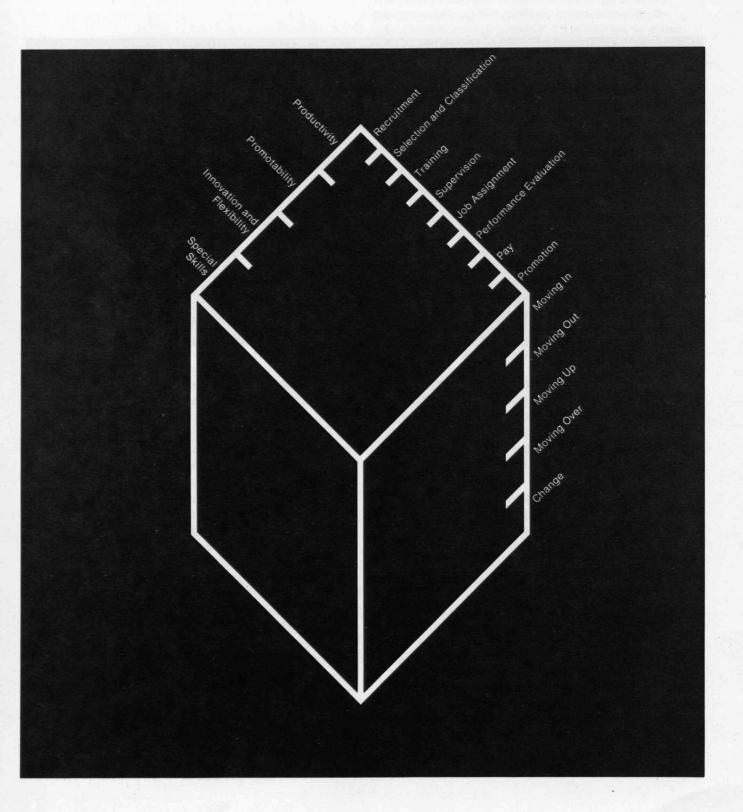
It will be useful, I think, to put these two sets of variables together in a matrix to see how they relate to one another. Doing so helps us to see to what purpose each of the optional interventions may be used. We can already begin a resource allocation as we see what we are trying to do.

The matrix of these variables printed on this page includes numbers arbitrarily assigned to suggest the effect of the variable treatments in the column on each outcome in the rows. You may not agree with the numbers, but they will do for illustration. They serve to focus, so far, on several things:

- 1. They emphasize what a particular variable will do for a particular outcome.
- 2. The row totals give some idea of the over-all effectiveness of various optional inputs. Here supervision, assignment and promotion are the most powerful factors. Pay is, surprisingly, the least.
- 3. The column totals give some idea of the responsiveness of various outcomes to treatment, overall. Recruitment is least responsive to change; turnover is most. Costs being equal, unit investment in one is much more productive than in the other.

- 4. The matrix could be used diagnostically, to assess what a company does as opposed to what it might do and to make guesses about the cost to do better.
- 5. The matrix begins to show the interaction of outcomes and inputs. If recruitment works splendidly, some of the pressure is taken off training and vice versa. Recruitment has most effect on who comes in; supervision, assignment and promotion make more difference to who goes out. It is foolish to invest in recruitment without stopping the leaks in turnover. Lateral movement in the organization may call for a variety of special responses in the categories of pay, training, assignments, and the like.
- 6. A matrix like this forces us to see some of the hard empirical facts we usually do not have. We do not generally know the transitional probabilities from time to time in an organizational matrix—what the probability is of someone moving in, up, out, over, or changing. We do not generally know how much turnover costs, how much change takes place, or what is the effect of moving sideways. To manage the matrix, we need to know a great many things we do not know now. A responsible approach to the use of human resources requires the generation of empirical data in many of the boxes shown here.

This three-dimensional matrix combines the factors which change the effectiveness of people in organizations, the tools available to management to influence people's effectiveness, and the broad organizational goals in the management of human resources. It suggests in a useful way the interrelationships of all these factors — and the absence of quantitative information on their effects and relative importance.



Organizational Goals in Human Management

The matrix may be taken one step further. We have spoken of what actions management can take and what effects they have, but we have not dealt with the reasons behind them. What are the organizational goals in the management of human resources? Once more, by using broad categories, we can list a small number of them.

- 1. Productivity
- 2. Promotability
- 3. Innovation and flexibility
- 4. Special skills

Now we can put the three lists together and make the three-dimensional matrix shown opposite. It shows even more clearly how the variables interact on one another. Pay may well increase change in productivity but perhaps not in innovation or flexibility. Cross-functional job assignments may lead to change, facilitating promotability, special skills, and flexibility; but they may inhibit productivity and cause some difficulties in pay and performance evaluation, and they may lead to turnover. Recruitment may raise the level of productivity and promotability but it places special demands on pay, promotion, and training. The dynamic character of the variables is clear. We no longer treat them in bits and pieces; they are integrated parts of a whole system.

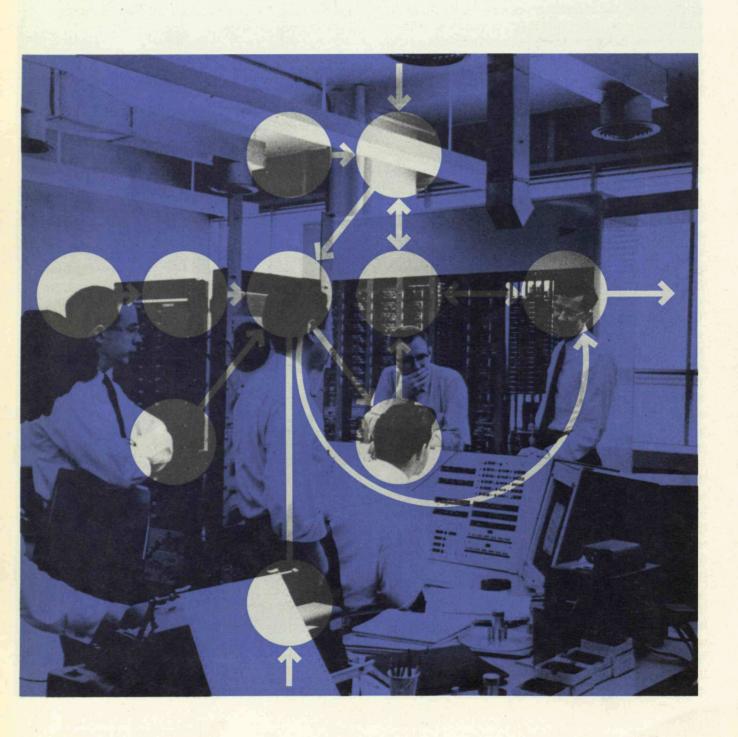
Incidentally, it is possible to isolate one variable, collapse the matrix across each of the other dimensions, and ask what is important to the goals of productivity, promotability, flexibility, and special skills. Assigning numbers to each of the boxes, I found that pay and training stood out as the most important variable inputs, and that turnover and change were the most important intermediate variables. It is also possible, by collapsing the matrix, to ask which of the four goals—productivity, promotability, flexibility, and special skills—yields best to optional interventions or intermediate variables. I find that productivity is easily the simplest one to influence, promotability next, skills next, and flexi-

bility least. This order may not surprise anyone, but at least it sets part of our problem, and we are now further armed with the ways to attack whichever one we need to get at.

There is now some promising work in progress at M.I.T. to formalize and program a model of variable inputs and organizational outcomes of this kind. If successful, the result would let us simulate interventions and determine their effect over any period of time, would gauge the sensitivity of the system to various treatments, and could, in this way, generate normal implications, given management's values for outcomes. Such a model might have analytical value, too, in unearthing interactive effects among parameters and in highlighting what may be hidden aspects of customary treatments on the total process.

But as it stands, it will be an abstract model, a kind of logical chess game. If the model is to make contact with reality, management will have to say exactly what is wanted and provide the mechanisms for measuring it. If goals can be defined and behavior measured, the model will go beyond an abstract set of relationships, far beyond our present bits-and-pieces approaches, to become a tool for broadly monitoring the effectiveness of the management of human resources.

Mason Haire came to M.I.T. as Visiting Professor from the University of California in 1966 and this fall became Professor of Organizational Psychology and Management in the Alfred P. Sloan School of Management, where he assumes leadership of the School's organizational studies. This paper has been adapted from the second Douglas M. McGregor Memorial Lecture published in the Spring, 1967, issue of *Industrial Management Review*.



"Technological gatekeepers" hold the key to effective communication in industrial research and development

Communications in the Research and Development Laboratory

Ask any manager of research and development what are the most serious problems affecting the efficiency of his work, and his answer will almost certainly involve some aspect of communication. The communication of ideas is central to the research and development process, and without effective communication among its participants, the quality of the work must necessarily suffer.

Despite its importance, however, little has been known until quite recently about the manner in which scientific or technological information actually passes from one person to another. This article presents results from a series of studies conducted over the past few years in the Sloan School of Management to explore the process of information flow in research and development organizations.

Two rather general conclusions result from earlier studies at the Sloan School: First of all, surprisingly few ideas flow into the laboratory directly from the scientific or technological literature; in the case of some 19 research and development projects studied, for example, only 15 per cent of the "idea generating messages" could be attributed to the literature. And more significant for management, perhaps, is the finding that extra-organizational channels consistently perform more poorly than internal information channels in the provision of technical information; this was first seen in the case of proposal competitions where teams which relied more heavily on information sources outside of their parent organization consistently produced proposals of poor technical quality. Lack of technical capability within the laboratory was largely responsible for the decision to use outside sources, and inverse relations were found between the use of such sources and the size of the laboratory's technical staff and its ratio to the laboratory's total employment. Laboratories which do not have the necessary technical manpower resources attempted unsuccessfully to substitute through reliance upon outside technical personnel.

On the other hand, the use of internal consultants bears a weak but consistently positive relation to performance. It is best, of course, to have the information already available among the proposal team members; but when information must be sought, as indeed it often must, then sources within the information seeker's organization seem much more capable than outside sources of fulfilling the need.

But among academic scientists, W.O. Hagstrom in his book *The Scientific Community* found a strong positive relation between performance and extraorganizational communication. In this instance, the organization (an academic department) occupies a subsidiary position to a more inclusive social system—the "invisible college" or academic discipline. While the communication process (in Hagstrom's case) is external to the academic department, it is *internal to the academic discipline*.

The concept of a shared coding scheme produces a rather simple and straightforward explanation for all of this. In industrial and governmental situations, the laboratory organization assumes an overwhelming importance, demanding loyalty and affiliation far beyond that required by academic departments. The members of such organizations acquire shared coding schemes, or common ways of ordering the world, through their common experience and organization that can be quite different from the schemes held by other members of their particular discipline. This is not true of the academic scientists, whose alignments seem to develop more strongly with others who share their peculiar research interests than with those who share a particular university or department; in other words, an "invisible college"

now becomes the mediator of the coding scheme.

It is possible, of course, to hypothesize upon devices to reduce the organizational boundary impedance. One of these possibilities, which may well arise spontaneously, is a two-step process in which certain key individuals able to do so act as bridges linking the organization members to the outside world. Information then enters the organization through these individuals, operating within and transmitting between two coding schemes.

The possibility that such individuals exist, who in effect straddle the closed society of the organization and the wide open one of the outside world, function efficiently in both, and cross easily between them, holds obvious significance for their potential usefulness in information transfer. Recent studies in the Sloan School have sought to identify such people in connection with an examination of the flow of information both into and within the confines of research organizations.

But before turning directly to this particular problem, let us briefly review a body of research on the flow of information in a somewhat different context.

Public Opinion Research

Twenty years ago, P. F. Lazarsfeld, B. Berelson and H. Gaudet, to explain a phenomenon which they observed in decision-making during the course of the 1940 election campaign, first proposed what has become known as the two-step information flow hypothesis. It appeared that ideas flow from radio and print to opinion leaders and from them to the remainder of the population. Instead of a simple direct connection between mass media and the general public, the process is more complex, involving the individual's social attachments to other people and the character of the opinions and activi-

ties which he shares with them. Thus the response of an individual to a communicated message cannot be accounted for without reference to his social environment and to the character of his interpersonal relations. This two-step flow was found to be mediated by "opinion leaders" who in every stratum of society perform a relay function: controlling the flow, for example, of political information from mass media to electorate and thus influencing the vote. The opinion leaders proved to be considerably more exposed than the rest of the population to the formal media of communication. And they were most likely to be exposed to the media appropriate to the sphere of their principal concern, and to have a greater number of interpersonal contacts outside of their own groups.

This hypothesis appears well established in the wide context of public opinion. An obvious next step is to ask whether it is relevant to the far more specific problem of communications in research and development organizations.

Our earliest studies gave some evidence that members of an engineer's immediate work group or colleagues in other parts of the organization are often instrumental in delivering information to him or making him aware of the existence of a particular source. Repeatedly we found that several sources, rather than one single one, had contributed to the discovery or formulation of a particular idea. In one case, for example, an engineer's colleague hears a paper at a conference of the Society of Automotive Engineers, associates the device described with a problem the engineer is tackling, and tells him about it. The engineer follows up the lead by searching the literature, writing the man who delivered the paper, and making arrangements with a vendor who can supply some of the hardware. Another case is quite similar. A vendor visits a particular engineer and

tells him about a new piece of equipment that his company has developed. The engineer knows of a colleague to whose problems this equipment might be relevant and suggests that the vendor call on him; the application turns out to be appropriate.

These instances, stated exactly as they were related to the interviewers, are not isolated occurrences. Very frequently an intermediary directly relays information he has obtained from another source, or indirectly assists in the transaction. The early studies certainly suggest the possibility of a two-step flow in technological communication.

Networks of Communication

The evidence I have cited encouraged us to design a second series of studies, aimed at defining both the nature of the process by which information flows into the organization and the channels through which information proceeds among the scientists within it.

Turning first to information exchange within the organization, we investigated the influence of two factors on the structure of the network through which technical information flows. These were the organization's formal structure—the work groups as they appear officially on the organization chart—and its informal structure—patterns of friendship and social encounters. We examined the impact of these factors on communications in two organizations; the first was a small laboratory in which 34 professionals were actively engaged in work on new materials and devices in the fields of direct energy conversion and solid state electronics, both for military and industrial applications, and the second a department of a large aerospace firm.

We asked the scientists in the two laboratories the following questions:

- 1. Socialization: Name the three or four persons from the laboratory with whom you meet most frequently on social occasions.
- 2. Work group: Name the people whom you consider to be members of your present work group.
- 3. Technical discussion: Name the three or four people with whom you most frequently discuss technical matters.
- 4. Special information: Please think back to the last technical assignment you completed and try to identify the most difficult technical obstacle or subproblem you had to resolve in the course of this job. Indicate the sources of information which were especially helpful in overcoming this obstacle.
- 5. Research idea: To whom in the laboratory would you first express an idea for a new research project?

Our questionnaire to the small laboratory employees also included two questions dealing with individuals'

methods of gathering information. These asked the number of technical periodicals read regularly and the extent to which personal friends outside their organization and technical specialists inside were used as sources of information.

The figures accompanying this article summarize our results; in compiling them we used three different criteria to measure information flow—technical discussion, information to overcome central research problems, and discussions of research ideas (from questions three, four, and five, above).

Scientists in both the laboratories we studied tended largely to discuss technical matters with the individuals with whom they also met socially. In the small laboratory this results largely, but not entirely, from the rather tight clique found among the Ph.D.'s in the group. As a matter of fact, the relation between socializing and technical discussion is not statistically significant when we consider the Ph.D.'s alone. In the larger research and development department, by contrast, the choice of individuals for technical discussion does not appear to be related to any differentiation of status.

The two other criteria of information flow show less obvious connection with the social network than does technical discussion. Only in the larger laboratory in the case of the upward flow of research ideas, in fact, is there any significant relationship. Nevertheless, since the technical discussions between colleagues are certainly an important mechanism for transferring technical information of various sorts, and even though we cannot determine from these data what is the primary impetus (that is, whether socialization brings about transfer of information or technical discussions lead on to social contacts), we conclude that the laboratory's informal structure has an important position in information transfer.



Respondent

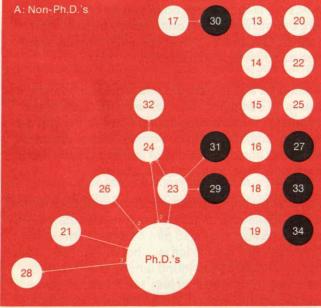


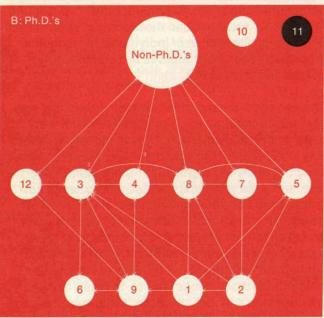
Non-respondent

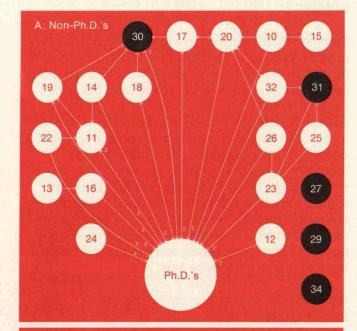
Where more than one connection exists, a number next to the arrowhead indicates the number.

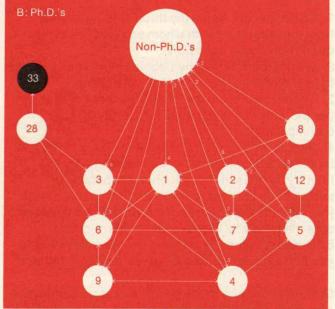
These figures illustrate the pattern of relationships among the members of a small research and development laboratory. In the left pair of charts the arrows indicate the direction of socialization choices; at the right the pattern of technical discussion choices. Since two distinct cliques were evident, those holding and not holding Ph.D. degrees are shown separately in these diagrams.

The large circle labeled "non-Ph.D." at the left, representing the Ph.D. to non-Ph.D. choices, shows practically no social intercourse between the two groups. The circle labeled "Ph.D." above gives an indication of which non-Ph.D.'s choose into the Ph.D. group. Nine non-Ph.D.'s do so but in only two cases, subjects 24 and 28, is the choice reciprocated. Reciprocal choices are indicated by the double-headed arrows.









The question of the impact of the formal structure of the organization upon communication remains. Comparison between the work groups and the social networks shows that, while much of the socialization does occur within work groups, the two networks are somewhat independent and should exert separate influences on information flow. If anything, the formal organization influences communication even more strongly than the informal network. The structure of the work groups influences not only technical discussion but also the upward flow of ideas. In fact, the part of the social network beyond the individual's work group has rather less influence on technical discussions than the complete informal network. Clearly, then, the formal organization is the more important, but by no means the sole determinant of information flow.

The Impact of Status on Communication

Several experiments by social psychologists have demonstrated that in social systems based on status hierarchies, individuals high on the status ladder will tend to like and communicate frequently with one another, while those low in the hierarchy will neither like nor communicate with each other as much. In addition, the members of lower status will direct most of their communication toward those in the higher status clique, although the subjects of their attention do not generally reciprocate it.

The small laboratory provides an almost perfect example of this. Even a casual glance at the figures on page 34 shows the impact of status (exemplified here by possession of a Ph.D. degree) on the laboratory's communication network. The Ph.D.'s form a tightly knit group; they apparently communicate quite freely among themselves but seldom meet socially or discuss technical matters with the non-Ph.D.'s.

This Ph.D. cliquism could in itself drastically disrupt the organization's performance, but an even more serious effect is evident. The non-Ph.D.'s in the laboratory scarcely socialize with one another, and they discuss technical matters among themselves far less than do their Ph.D. colleagues. Furthermore, the non-Ph.D.'s direct the majority of both their social attention (64 per cent) and technical discussions (60 per cent) to the Ph.D.'s. By contrast, the Ph.D.'s direct only 6 per cent of their social attention and 24 per cent of their technical discussion to the non-Ph.D.'s.

Some 15 years ago, H. H. Kelley, Ph.D. '48, explained the tendency among the lower members of a two-level hierarchy to direct their attention upward as a form of substitute promotion for those who wish to move upward in the organization. A few years later, A. R. Cohen found that one form of communication with upper members of the hierarchy (conjectures about the nature of the higher status job) increases both when "locomotion is desired but not possible

and where it is possible but not desirable." We can best describe the situation in the smaller laboratory as one in which upward mobility is highly desirable but, in the short run, impossible. It is, therefore, hardly surprising that the non-Ph.D.'s should try to enhance their own status by associating with the higher status Ph.D.'s in the laboratory. An organization which employs both Ph.D.'s and non-Ph.D.'s together in the same tasks is almost certain to give the most rewarding experiences, as well as publication and recognition, predominantly to those holding the advanced degree. This state of affairs drives the non-Ph.D.'s to a strategy of gaining reflected glory as satellites of the higher status group; they therefore tend to avoid associating with their lower status colleagues in the effort to gain vicariously the kudos denied to them in reality.

Technological Gatekeepers

Thus far I have restricted myself to the problems of exchanging information between people. Just as important to research management, however, is the stage that immediately precedes this in the chain of communication—the methods and sources that individuals use to gather their information. Looking back at those individuals who were chosen most frequently by their colleagues for technical discussion, or who were cited as sources of critical incident information, we are now able to compare their behavior with that of their colleagues to see whether these "opinion leaders" display any systematic differences in their use of the information system. We compare these "opinion leaders" with their apparently less-informed colleagues in terms of their use of friends outside the laboratory, of technical staff within, and of the technical literature.

Table 1 illustrates the difference between the information gatherers and their colleagues in the small laboratory. The technological gatekeepers clearly Table 1: Comparison of Communication Behavior and Technical-Discussion Choices Table 2: Comparison of Communication Behavior and Identification as the Source of Special Technical Information During One of the Lab's Projects

Based on Mann-Whitney U-Test performed between the two groups.	Number of Times Chosen on Technical-Discussion Matrix Six Four Level of or or statistical more fewer significance			Seven individu cited	Level of statistical significance	
Percentage who are above median in using personal friends outside the laboratory as an information source	64%	25%	0.06	67º/o	30%	0.10
Percentage who are above median in using technical specialists within the laboratory as an information source	50	40	0.47	57	40	0.17
Percentage who are above median in total number of technical periodicals read	88	40	0.01	100	45	0.05
Percentage who are above median in number of professional and scientific periodicals read	75	35	0.001	86	35 .	0.03

read more of the literature and consult more with outside sources than does the average professional in the laboratory; the contrast is especially pronounced in the case of professional journals (those sponsored by scientific and engineering societies).

We also used another criterion of information flow to identify the main sources of information in the laboratory, asking the scientists to indicate the source of any information which influenced the course of their most recently completed research projects. Twelve people in the smaller laboratory cited seven colleagues as the sources of that information, and Table 2 compares these seven with the other professionals in terms of information gathering behavior. The pattern of greater outside contacts and more exposure to the literature reappears.

Thus, there appear to be two distinct classes of individuals within this laboratory. The majority have

few information contacts beyond the bounds of the organization. Their internal sources are the other class—the small minority which has extensive contacts outside the laboratory. Information flow in this laboratory is a two-step process, wherein six or seven individuals act as technological gatekeepers for their colleagues. Indeed, the study showed that two of these gatekeepers were responsible for introducing all four of the "most important technical ideas" that had been introduced into the organization during the preceding year.

The individual gatekeepers vary somewhat in the actual sources of information that they use. Some rely more upon literature than discussions, while others operate in reverse manner. If a gatekeeper has a greater number of contacts outside his laboratory, he does not necessarily read the literature more, and vice versa. Therefore, since the gatekeepers do not all tend the same gate, the laboratory as a whole

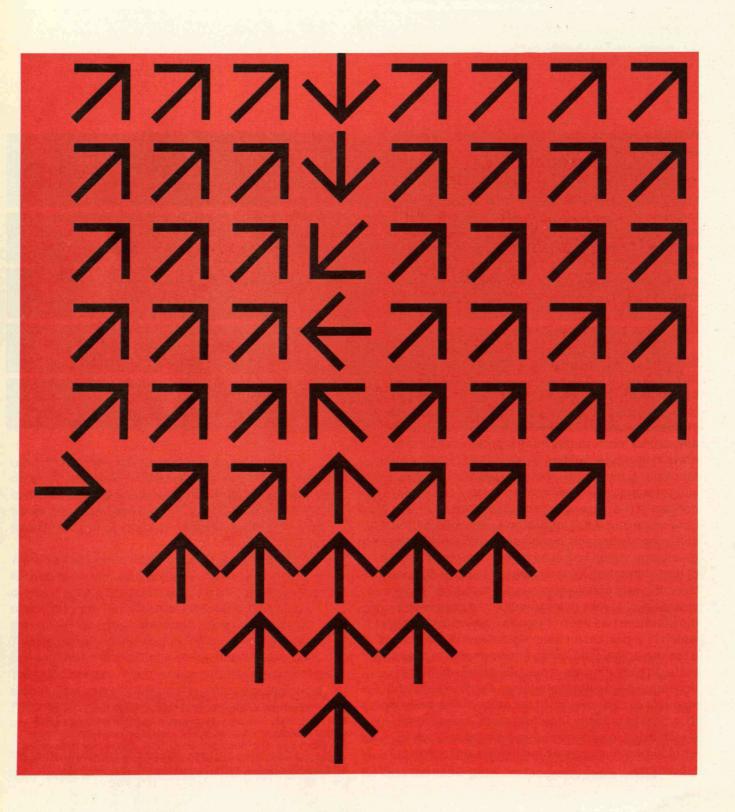
receives a balanced quota of information from the outside world.

The opinion leaders in the laboratory are not of a monolithic sort. Each has his own sources of information and information from each gatekeeper has its own particular function in the laboratory. The situation closely resembles that in the world of mass communication to which I referred earlier in this article. In that context, opinion leaders could be differentiated by topic: those influential in public affairs were not necessarily influential in determining fashion patterns, for example.

We can perhaps extend the analogy between the laboratory and mass communications a little further by examining the source literature of the opinion leaders in the two situations. Studies of mass communication showed that movie leaders read movie magazines more, public affairs leaders read more news magazines, fashion leaders read more fashion magazines, and so on. This background strongly suggests that we should look in more detail at the content of the messages processed by the various gatekeepers in R & D laboratories. By analogy, the selection of channels by scientific and technological gatekeepers may be based on the qualitative nature of the information in which the gatekeeper specializes, different channels varying in their ability to provide different types of information. As an example, the literature has been shown to provide information which is important for keeping abreast of the state of a technological field, while oral sources are probably better in providing more specific detailed information about particular techniques. Gatekeepers who specialize in knowledge of the state-of-the-art would thus tend to read the literature more, while those specializing in particular research techniques would interact more with individuals outside the laboratory.

The studies I have described hold two very significant implications for the managers of research and development laboratories. First, they suggest that managers should aim to understand the factors which influence the flow of technical information in the organization; some of these factors are under the management's control and can be used to improve the communication system in action. Second, they emphasize that management should recognize the value of technological gatekeepers; all too frequently rewards by-pass the individuals responsible for information transfer, and managers often fail to make effective use of these individuals.

Dr. Allen came to M.I.T. for graduate study in 1963, following work in electrical engineering for Tung-Sol Electric Company and the Boeing Company. He joined the Institute Faculty as Assistant Professor of Management upon receiving his Ph.D. from the Sloan School of Management in 1966. The research on which this article was based was supported by grants from the National Science Foundation, Office of Science Information Service.



How I Stopped Worrying and Learned to Live with Irrationality

Recently, while I sat listening at a national conference on the management of sophisticated technical programs, I suddenly realized that throughout that meeting both the speakers and their audience had been subscribing to an unwarranted assumption. Underpinning the propositions being made was the inference that both those responsible for instituting changes in programs of sophisticated technology and those affected by the changes are capable of making rational and logical decisions. But this assumption is false; when human beings (regardless of the extent of their education or intelligence) are involved in changes, their ability to behave rationally is severely restricted. Faith in the essential rationality of decisions made in these circumstances is both naïve and groundless.

I was scheduled to present a paper as the penultimate event of the conference, before a concluding luncheon, and I decided to test my conclusion in an informal and simple way. At my instigation, the chairman announced that I had more material than the organizers had anticipated and that, in view of its great potential benefits for all those present, there would be a change in schedule and I would conclude my talk sometime after luncheon. I rose to speak among mumblings of dissent. As I started, two people actually walked out. When I asked the audience for reactions to this trivial change (which did not, of course, materialize), the comments showed that many were prepared to resist it strenuously, even though the chairman had assured everyone that it was in their best interests. Rationality, it seemed, had fled the meeting before me.

Conflict of Emotions and Reason

Why should even such a trivial change cause emotion to prevail over reason? Why are changes so often a disruptive force when introduced into a stable organizational system?

Any change affects established and accustomed ways of working, the way people think and feel about themselves in relation to their work, and established social relationships. Almost overnight anyone

involved in a change can find his work world and personal circumstances and relationships altered. Instead of a familiar, predictable world he faces unknown elements and prospects and a largely unpredictable future. He becomes aware of a loss of control over his environment. His position has shifted from apparent security to insecurity.

All changes, no matter how seemingly trivial, cause those involved, no matter what their background, to confront these issues in some degree and to have concerns and apprehensions. Questions about competence in the new situation are almost certain. Similarly there are often concerns about status, security, and financial circumstances. Will the work remain satisfying, enjoyable, and convenient? How will the new situation affect future relationships with others in the organization? And, in considering the change, to what extent has the organization thought about individual needs, ideas and feelings?

All these issues can be charged with emotional overtones. When an individual is sufficiently suspicious or fearful that his most important needs and expectations will not be met in the new situation, anxieties can overpower logical thought and rational behavior. When emotions are intense, decision-making can become totally irrational. The consequence is resistance to the change.

Irrationality in Action

An individual responds to a change first in terms of feeling and attitudes. How do these in turn affect his actual behavior in reaction to the change?

Frustration is the feeling most frequently experienced by those involved in or exposed to change. This frustration, occurring when the individual's expectations or actual experiences of the change's consequences conflict with his own needs and desires, gives rise in turn to aggressive feelings. These he may channel in a number of different directions. For example, he may actively resist the change, directing his aggression to the source of the frustration. Or perhaps he may deflect his

aggressive feelings in other directions — toward those responsible for implementing the change, for example, or toward innocent scapegoats. He may even turn inward on himself, losing all interest in his work, turning to outside activities such as hobbies or local politics, or even developing psychological illness. Behavior stemming from aggressive feelings can take many resistant forms, from sabotage to absence to passive indifference.

Whatever actions he may feel he wants to take, a number of subtle organizational and group pressures meshing with traits of his own personality restrain every individual from acting out his own desires. Typically he modifies the action he would like to take, although this is often an unconscious process.

By organizational pressures I mean the requirements imposed on individual behavior by the following: the specific structures of the formal and informal organizations; the technology of the work; the allocation of job duties and responsibilities; the levels of skills required to perform the work; how the pay and other rewards systems operate; company policies, procedures and practices; company cultural beliefs . . . myths, taboos, traditions; management control procedures; and the communication and information systems. Additionally, the dynamics of the work group itself generate some other pressures that also tend to reduce variations in behavior among its psychologically different members. These group pressures stem from the history and culture of the group, from the nature of its formal and informal leaders, and from the patterns of power and trust which have become established. All these have a profound influence on the establishment and maintenance of behavioral norms.

Whatever form it takes, resistance to any change is essentially an act of self-protection. When an individual perceives that the consequences of a change conflict with his needs, aims and desires, he will probably become anxious and fear for his future. Alternatively, he may become outraged at the way "the company" is treating him. Whether or not the circumstances justify such response is irrelevant. What is important is his negative attitude toward the cause of his anxieties, fears or outrage: the change and/or its perpetrators. Such a process as this has little connection with intellect, logic and rational thinking. Nevertheless, once one commits himself to a course of resistance, he can easily justify his actions to himself by finding convenient rationalizations.

On the other side of the fence, any resistance to a change may appear to those responsible for the change both mystifying and frustrating. The originators and implementors of any change are naturally impressed with its aims and pay-offs; to them, the

anticipated benefits clearly outweigh any disadvantages or problems. Typically they assume that everyone, including those directly affected, will view the change in the same way as they do. When they encounter resistance, those making the change must face the possibility either that their assumptions were wrong or that they are carrying out the change ineptly. Such a reappraisal can be a painful experience. Both flexibility and imagination are required to view a set of circumstances through another's eyes, and against a set of values and preconceptions different from one's own.

Two examples illustrate dramatically how deepgrounded fears and lack of flexibility can destroy the value of changes that are well conceived and fundamentally worth while:

In a company involved in the space program a technical group located in headquarters wanted to introduce some improvements in the procedure for launching missiles at its remote launching site; these demanded substantial changes from the launch crew's accepted practices. The technologists introduced the new procedures in a rather arbitrary and perfunctory way, believing that the advantages would be obvious to all and thus immediately acceptable. The launch crew saw the situation very differently. First, they were outraged that the technical group had not consulted them, and resented being given "orders." Additionally, because they were far more intimately involved and experienced in the detailed practicalities of the launching procedure and its problems than the technical group at headquarters, and because they spotted some flaws in the new procedure, they were quick to conclude that it was unsound, even though it actually would have represented some genuine improvements once the flaws were corrected. Despite conflict with the launch crew, the headquarters group insisted that the crew comply with the new procedure. At the next missile launching, the crew (still smarting) did this to the letter, refusing to take possible actions to correct the flaws. In consequence, the launch was a costly failure. The better procedure was abandoned because no one had tried to overcome the crew's resistant attitudes. The crew failed to contribute their on-the-spot detailed knowledge which could have corrected the difficulties and made the new procedure effective and successful.

As another example, a decision was made at a high level in government to merge two groups of civilians working on military projects of an advanced technological nature. One group was primarily technical in nature and the other essentially managerial. They were located in different parts of the country. On purely rational grounds such a merger was sound, as the two groups collaborated closely on much material. Those making the decision assumed that

the merger was in the best interests of both groups and would increase their working effectiveness; hence they expected the members of both groups to welcome the change. Instead, they met intense resistance. Many saw the change as a threat to their status and were upset with the seemingly unilateral nature of the decision. At the outset of the change several members of the technologically oriented group resigned. The remainder became active in politicking to unseat the senior management that had made the decision to merge. Both groups resisted the merger actively through the period of more than three years in which the originators of the idea were exerting pressure to complete it. Finally, when the senior management decided to force the move, everyone in the technical group quit.

In considering these two episodes, the reader might well wonder why scientists and engineers, well trained in the rational disciplines of the scientific method, cannot adopt a dispassionate attitude toward change and gear their actions to logical and reasoned evaluations of its benefits balanced by its adverse effects. These two accounts suggest that scientists often respond just as irrationally as those who have not had the benefit of scientific training. Why should this be so?

In my view, scientists may be governed by their emotions when changes affect them in significant ways precisely because of the special attraction (often unconscious) which originally motivated many of them to become scientists.

It is possible when a scientist faces a situation involving change and people, neither of which he can control, he may develop strong anxieties simply because he feels helpless. He cannot control this kind of situation in the way he is accustomed to controlling his more predictable physical environment. Yet this concept of control probably was central to his original attraction to a scientific or engineering career. Because in these circumstances frustration can be especially intense, irrationality and resistance are also likely to be very strong.

Basis of Behavior

If irrationality is a major factor in decisions people make when they are involved in changes, managers must ask whether they can influence the extent of irrational response through the way in which they institute any change. To approach an answer to this question, we must look more closely at the way in which human attitudes are translated into behavior during times of change.

In any particular change, at least seven factors combine to generate an individual's attitudes. Two of these derive from the individual's basic personality and have no connection with the change itself: his

predisposed feelings about changes of any kind and the extent of his feelings of general insecurity. Both are emotional residues of early experiences with the changes involved in developing from infancy through childhood. Three of the factors stem from the organizational context but have no direct connection with the change at hand: the prevailing traditions and other cultural beliefs within the organization which might conflict with the change, the amount of trust that those involved in the change hold for their management and colleagues, and previous relevant events in the firm's history, such as the past record of the management and its conduct in previous changes. The final two factors result from an interaction among the five I have already mentioned and the particular nature of the change: the individual's specific apprehensions and expectations about the change, and his response to the manner in which the management introduces and implements it.

Combining these seven factors we obtain the model shown on page 42, which traces the development of the individual's actual behavior in response to a change. Clearly the pressures involved may well impel him to react in a more (or less) restrained manner than he originally wanted. And his attitude to the change once it has reached completion may differ from that beforehand, as a result of his experience of the change and rationalizations of his behavior during its implementation.

The behavior of the members of the management conference I cited at the start of this article illustrates how group pressures modify actual behavior. Although many more members may have wanted to walk out of the conference than the two who actually took such drastic action, this large majority modified the way in which they actually behaved because of pressures to act in a socially acceptable manner. Still, they may later have expressed their negative feelings subtly, through a more acceptable channel by disagreeing with the ideas I presented, for example, or asking awkward questions in the discussion period. Alternatively, had they responded favorably to my presentation, their early feelings of hostility and desire to embarrass me might have evaporated.

Clearly, then, resistant feelings do not always lead directly to resistant behavior. And if a change evokes few resistant feelings at its outset, we can expect little resistant behavior.

This point is central to the issue of dealing with irrationality in decision-making when changes are being made. To realize fully the anticipated benefits of any change, all decisions made within the context of the change must be and be understood to be sound; irrationality must be minimized. If we assume

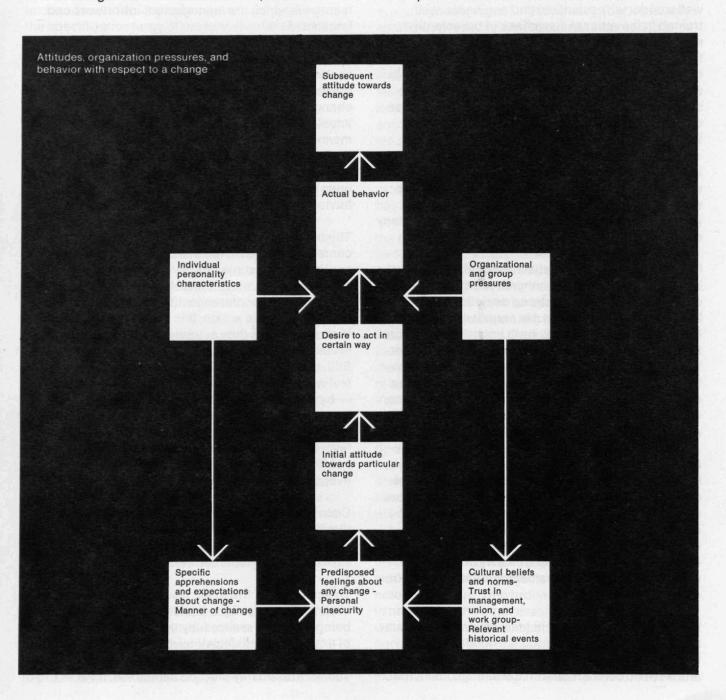
that irrationality in these decisions stems from resistant feelings, management should better be able to achieve the aims of the change by minimizing resistant feelings.

Reducing the Resistance

Before addressing this particular problem, we must in some way describe the relationship between resistant feelings and the factors responsible for them. The model below summarizes the influences of all factors which combine to produce resistant feelings. From this "equation" emerge a number of points of interest to management. It is significant that a person's predisposed feelings about change, his general sense of security, and his basic trust in management exert most influence on his resistant feelings. These three factors, over which management has little influence, have far

greater effect on the individual's final behavior than any others. Thus, management can carry through any change successfully even if it shows little concern for the human implications provided that the people involved have strong feelings of security, if they trust their management or union, or both. On the other hand, a change could fail to proceed smoothly even if the management shows active concern for those affected if the people involved have great apprehension, feel personally insecure or have little confidence in management.

Also significant is that at the time of any change, management has, in fact, full control over only two factors — the manner in which the change is introduced and implemented, and the extent and nature of apprehensions and expectations about the future in the specific case. Both involve the extent to which



the conflicts between the interests of the people involved and those of the organization are rationalized. To a limited extent, management can exert influence over two other factors — the apparent conflict with prevailing cultural beliefs, and the interpretation of previous relevant events in the company's history. But to minimize irrationality and resistance during genuinely worth-while changes managers should focus their main efforts on the two aspects which they can control fully.

To Reduce Irrationality

Eight characteristics of any change and its organizational context are likely to have a profound effect on irrational feelings and can be influenced by management. It is on these issues that managers should concentrate attention when changes are to be made:

- 1. Compulsion through the use of authority inevitably increases frustrations, because of additional pressures, because of increasing limitations on freedom to act, and because out of compulsion comes an increased feeling of dependency one feels himself to be at the other's mercy.
- 2. The success of *persuasion* is a key variable, and this in turn depends on the extent to which the rewards offered are relevant to and counterbalance and outweigh the basis for resistance.
- 3. The fears of change are often based on fears for *security:* redundancy or inadequacy.
- 4. There is a direct relationship between resistance to a change and an *understanding* of it on the part of those involved. Everyone concerned should develop as full an understanding as possible. In this connection it is worth noting that many normal communication channels are themselves impaired during change. Although every medium of communication should be used, face-to-face discussion is by far the most effective means.
- 5. Resistance varies inversely with the length of time between the announcement of a change and its initiation. The extra time gives a chance for those involved to accommodate themselves and to understand what is happening. On the other hand, resistance varies directly with the length of time it takes for the change to be realized, once begun. Also, timing with respect to other relevant events can be of critical importance.
- 6. The more there is personal *involvement* in decision-making, the less resistance there is to following the decisions. Interest in the work is heightened, perceptions are altered and a sense of personal responsibility and commitment is developed. But the success of the involvement depends upon the desire for participation and the assurance of management and supervisory sincerity and openness to ideas other than their own.
- 7. Any change can imply *criticism*, and criticism leads to resistance. Careful accommodation to past

traditions and practices is a good neutralizer.

8. Rigid implementation of change, without allowances for modifications in methods or results, inevitably produces resistance. Management should be clear about aims and expectations while retaining flexibility about the means for accomplishment. The use of trial periods or groups can be helpful.

Here are four cardinal rules about how to make changes and how to meet the inevitable irrationality which will follow:

- 1. When there is a need to institute a change, drop the assumption that those affected will fall into line naturally if the basis for the change is sound and logical. Instead, expect that there will be irrationality in their response and that this irrationality will breed resistance.
- 2. In making the change, separate the process of conceptualizing what the change should be from the process of its introduction and implementation. These are distinctly different issues.
- 3. Devote at least as much time and effort to planning and working out the methods of introducing and implementing the change as you do the development of the ideas of what to change. This investment will pay rich dividends in the form of reduced resistance and increased benefits.
- 4. In planning to minimize resistance, focus on the eight variables already described, as these offer the most fruitful opportunities for influencing the critical feelings that underlie resistance.

Mr. Judson is a member of the Organizational Behavior Group of Arthur D. Little, Inc. He studied chemical engineering and industrial relations at M.I.T. and since 1948 was associated with U.S. Rubber Company, Polaroid Corporation, and The Emerson Consultants of London, England, before assuming his present post in 1966. Mr. Judson is the author of *A Manager's Guide to Making Changes* (John Wiley & Sons, New York, 1966).

Paul E. Dutelle, Inc.

Roofers and Sheet Metal Craftsmen

153 Pearl Street Newton, Massachusetts 02158

Lockwood Greene Engineers, Inc.

Complete range of professional engineering services for the planning and design of modern plants for industry

Pan Am Building 200 Park Avenue New York, New York 10017

Boston-Spartanburg-Atlanta

Alexander Kusko, Inc.

Consulting Engineers

Research and Development in Magnetics, Electric Machinery, Instrumentation, Semiconductor Circuits, Control Systems, Power Supplies

A. Kusko '44, E.A. Parker, Jr. '42, C.A. Rambottom '55

141 Main Street Cambridge, Massachusetts 02142

FL 4-4015

Syska & Hennessy, Inc.

Engineers

Design-Consultation-Reports Mechanical-Electrical-Sanitary Elevator and Materials Handling

John F. Hennessy '24, John F. Hennessy, Jr. '51

144 East 39 Street New York, New York

1155 15 Street, N.W. Washington, D.C. 20005

Edward R. Marden Corporation

Builders and Engineers

Edward R. Marden '41 President Registered Professional Engineer

280 Lincoln Street Allston, Massachusetts 782-3743

Reduced Travel Rates

For M.I.T. Alumni

Tours to the Orient, India, South America

For details write:

Technology Review Room E19-430 Massachusetts Institute of Technology Cambridge, Massachusetts 02139

Swindell-Dressler Company

Founded 1850

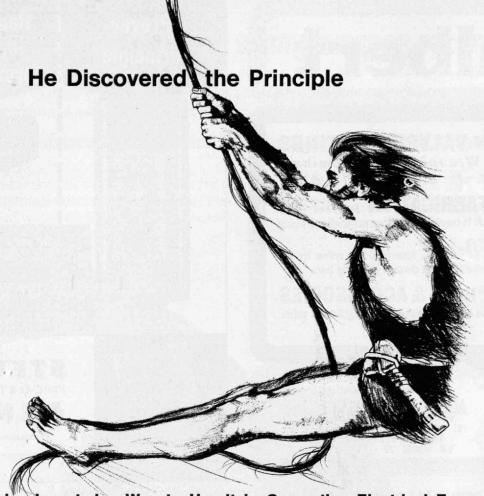
Engineers

A Division of Pullman Incorporated

Industrial Facilities-Public Works

441 Smithfield Street Pittsburgh, Pennsylvania 15222

Chicago-Harrisburg-Washington



Now We've Invented a Way to Use It in Converting Electrical Energy... We Call It PARAMETRIC POWER

By rhythmically varying a parameter of his vine (its length), man discovered how to sustain mechanical oscillation.

Based on an invention utilizing parametric techniques, that eliminates the need for the use of mutual inductance in energy transfer, Wanlass Electric has discovered a completely new way to convert electrical energy.

The most significant advantage to this new method is the transfer of energy free of transients. It also regulates voltage, has low wave form distortion, electrical

isolation, transforms voltage and has the ability to prohibit energy transfer under conditions of either underrated input voltages or over-rated output currents.

This new concept has been translated into a complete line of parametric power conversion products, including: Voltage Regulators, Line Filters, AC Power Supplies, DC Power Supplies, Inverters, DC Converters, and Frequency Converters.

All will bear the name PARAX®. Your inquiry will be welcomed.





Model P-5505 AC/DC Supply

This new concept will be embodied in equipment displayed at NEREM — in Booth 2H 24. Try to see it but if you can't, call or write Paul R. Sturgeon Co., 1330 Boylston St., Chestnut Hill, Mass. 02167; (617) 734-7710, and ask for a demonstration.

WANLASS ELECTRIC COMPANY

A subsidiary of American Bosch Arma Corporation 2175 South Grand Avenue, Santa Ana, California

albert

PIPE • VALVES • FITTINGS Steel / Wrought Iron / Aluminum

Plastic / Stainless / Alloy

PIPE FABRICATION From one coded pressure vessel to complete power plant pre-fabricated piping.

SPEED-LAY. Economical pipe system for oilgathering, dewatering and chemical processing lines.

PIPE PILING & ACCESSORIES

Composite pile extensions. Non-field welding H-Beam points and sleeves.



WRITE FOR FREE BROCHURE:

ALBERT PIPE SUPPLY CO., INC.

Manufacturers—Fabricators—Distributors 101 VARICK AVE., BROOKLYN, N. Y. 11237 Telephone: 212 HYacinth 7-4900 S.G. ALBERT '29 . A.E. ALBERT '56

MAKING A FEW GALLONS OF HOT, PURE WATER DO THE WORK OF THOUSANDS



512 Lanesville Terrace

Where M.I.T. people share in pure-water achievements.

A. WHITE, '26, President

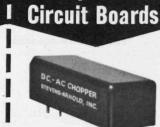
N. A. EVERETT, '48, Manager, Technical Services

V. C. SMITH, '48, Vice President, S. BERAN, '58, Experimental & Production

Developmental Engineer

Proven **Principle**

AC CHOPPER



Repackaged

for printed

LOW NOISE LEVEL TWIN CONTACT RELIABILITY LONG LIFE AC Drive Models DC Drive Models SPDT or DPDT MBB or BBM

Request Catalog No. 515

IIIII

STEVENS ARNOLD

QUALITY SINCE 1943

7 ELKINS ST., SOUTH BOSTON 27, MASS. 02127

5/A-33-1/4

-01191 रिश्र विश्व photoelectric scanner

Shown 80% full size . . .

- · Small-size: 10-foot scanning range
- Solid-state circuitry; plug-in relay
- Single-unit installation; NEMA-12 construction
- Time-delay model: adjustable 1/2 to 12 seconds
- Pre-wired 8-foot, 5-conductor color-coded cable

This new Farmer TR1R is a small gasketed NEMA-12 unit containing light-source, photocell, transistorized amplifier, plug-in relay, and powersupply transformer. Used with retroreflective disc or tape. 115 volts, 50/60 Hz. Available from stock.

Write for Bulletin A-130

PRODUCTS COMPANY, INC. Tech Circle, Natick, Mass. 01760 Telephone: 617-653-8850



The hidden problem that can dam a long success record

A sediment clogged water main, like the one below, can plug up your company's profit line. It's one of those little, hidden problems no company can afford to let grow into big profit loss. How many industrial loss areas are nesting in your plants? Your decision to contact us today may be the one to help maintain a steady flow of tomorrow's profits.

Boston Manufacturers Mutual Insurance Company / Mutual Boiler and Machinery Insurance Company

FACTORY MUTUAL INSURANCE

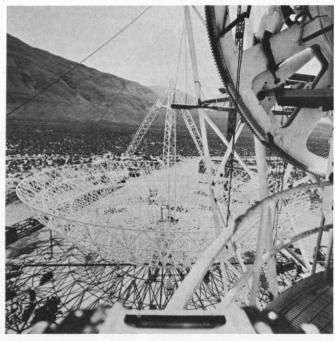
EXECUTIVE OFFICES: 225 WYMAN STREET, WALTHAM, MASSACHUSETTS 02154
CONTACT US TODAY FOR FULL INFORMATION ABOUT OUR SPECIALLY DESIGNED PROGRAMS
FOR INDUSTRIAL PROTECTION AND LOSS PREVENTION OF YOUR PROPERTY.

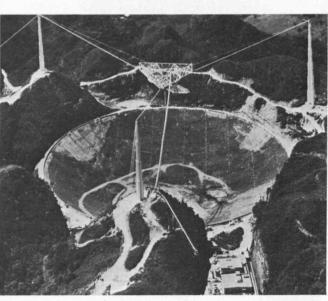


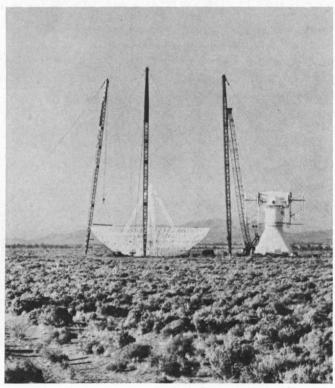


New type of radiotelescope antenna, shown in model below, has been proposed by an association of Northeast Universities as one solution to the country's lack of large radiotelescopes. The 440-foot diameter antenna will be enclosed in a radome to protect it from the effects of the weather. As a result of the radome, gravity is the only important force encountered in pointing the telescope, and instead of the conventional radial struts, the antenna is supported by eight vertical struts. It is powered by a small electric motor of a few horsepower; an instrument without a radome would demand a motor with horsepower of some thousands. A special National Science Foundation Panel was impressed by the design although it did not recommend immediate funding to put it into practice. The Panel did urge funding of a Cornell University project to resurface the 1,000-foot dish built into a valley in Puerto Rico (bottom, left) and a Caltech scheme to build seven 130-foot dishes to form an array with a similar dish now being completed (below, right).









Trend of Affairs

NSF Looks at NEROC

Radio astronomers in the Cambridge area had little time to spare for vacation this summer, unless they were prepared to combine pleasure with a business trip to Washington. For they were deeply involved in the deliberations of a National Science Foundation Advisory Panel on large radio astronomy facilities. Among the proposals before the panel was that of the Northeast Radio Observatory Corporation (NEROC) for a large steerable instrument for radio and radar astronomy.

NEROC, formed in July, broadens the geographic base of institutions developing a regional radio observatory compared with the Cambridge-based CAMROC organization (see Technology Review, Feb., 1967, p. 37). In addition to the four CAMROC members—M.I.T. and its Lincoln Laboratory, Harvard, and the Smithsonian Astrophysical Observatory—NEROC includes 10 northeastern institutions as widely separated as the Polytechnic Institute of Brooklyn, the State University of New York at Buffalo and Dartmouth College. Jerome B. Wiesner, Provost of M.I.T., is Chairman of the new corporation, and Edward M. Purcell of Harvard, Vice Chairman.

NEROC's summer labors brought forth a proposal for a 440-foot diameter steerable precision antenna (see picture) to be enclosed in a radome. It has a paraboloidal shape, and is designed to operate at high efficiency down to a wavelength of 5 cm. The radome solves the problem of erecting a large high precision antenna in the Northeast (and, incidentally, in any climate, however mild). It reduces the weight and expense of the telescope spectacularly, at very small cost in terms of the reduction of the system's performance. The NEROC proposal, in fact, represents a totally new direction in the design of large radio telescopes. The complete facility would cost \$27.8 million.

The NSF board received four other proposals for large-scale telescopes: California Institute of Technology proposed an array of eight 130-foot dishes, adding seven more to one nearing completion; Cornell University proposed to resurface its 1,000-foot spherical dish built into a valley at Arecibo, Puerto Rico, to permit observations down to wavelengths of 10 cm. or lower; the National Radio Astronomy Observatory (run by Associated Universities, Inc., of which M.I.T. is a member) proposed an array of 36 82-foot dishes; and a team consisting of Caltech, Stanford, the University of California and the University of Michigan suggested a conventional 330-foot fully steerable dish without radome.

The proposals, and the NSF panel to evaluate them, stemmed from the recommendations of a report by the National Academy of Sciences in 1964, calling for more United States facilities in radio astronomy. The Academy did not overlook—as many do—the fact that in terms of sheer size, and often of performance, radio telescopes in the United States lag behind rivals in Europe and Australia. The largest fully steerable radio telescope in the world is the Jodrell Bank facility in England, which has a 250-foot dish. This is closely rivaled in precision by the 210-foot dish at Parkes, Australia. Currently, the University of Bonn, in West Germany, plans to construct a 328-foot fully steerable antenna without a radome, and Sir Bernard Lovell is planning a 400-foot dish at Jodrell Bank. On this side of the Atlantic, the largest fully steerable precision antenna is a 150-foot-dish in Canada.

Despite relative lack of "frontier" instrumentation, U.S. radio astronomers have many firsts to their name over the last 20 years. Hydrogen, the OH radical and helium in space were all discovered at observatories in the Northeast, and U.S. radio engineers are pioneering a technique which aims to pinpoint the positions of quasars and clouds of gas in space by linking readings from two widely separated antennas.

However, comparing different radio telescopes is like comparing items on a menu: the choice really depends on what the astronomer feels like exploring at the time. The radius, surface area and tolerance of the antenna and the wavelength of the radiation to which it is sensitive, as well as the amount of the sky it can view, all have an important bearing on a telescope's performance. It was the task of the NSF Panel to provide some suggestions of these parameters for future U.S. radio telescopes.

The panel urged NSF to fund the Caltech and Cornell schemes as soon as possible, with the proviso that they make at least half the observing time at the facilities available nationally. The panel also expressed interest in both the NRAO and NEROC proposals. Their fifth recommendation reads: "The panel recognizes the success of NEROC in studies of a new vertical-truss, light-weight, fully-steerable dish in a radome. However, it is the judgment of the panel that the NEROC proposal should be deferred until more is known of the capabilities of an Arecibo-type spherical dish as a large precision instrument, operating at short wavelength."

Of equal interest to NEROC supporters is the sixth recommendation: "The proposal by the California Institute of Technology... concerning the design of a conventional 330-foot dish should be declined because of the more revolutionary possibilities inherent in the Arecibo and NEROC concepts."

What is the attitude of NEROC members to the report?

Joel Orlen, Administrative Officer of the M.I.T. School of Science at M.I.T., told *Technology Review* that it is a good report, and a positive one for NEROC. Before the panel passed judgment, NEROC had expected its main competition to come from conventional steerable dishes such as that proposed by Caltech. Now, in Mr. Orlen's words, "Recognition has been given to the new design possibilities opened up by the use of a radome."

However, NEROC has, as yet, no assurance that its instrument will be built. The NSF panel surprised many by putting NEROC in competition with a fixed spherical telescope. Instead of justifying its project against a fully steerable telescope without a radome, NEROC finds itself in combat with proponents of a fixed spherical dish on the Arecibo pattern. A. E. Lilley of Harvard College Observatory, who spent last year as a Visiting Professor at M.I.T. to devote his time to the CAMROC project, told Technology Review that NEROC had not foreseen the comparison with telescopes of the Arecibo type because they did not meet NEROC's scientific requirements—for example, in the amount of sky they can cover at any time.

The report expressed doubt whether New England would prove a good location for the instrument. But the panel apparently neglected the original purpose of the radome. There would be no difference in cost between a southwestern and a northeastern location for the NEROC telescope, Professor Lilley told *Technology Review*; NEROC's summary report puts the argument succinctly: "The large number of radio and radar astronomers in the Northeast makes this a highly desirable location for a major observatory. When a radome is used, weather ceases to be a decisive factor in selecting a site."

The contestants have now returned to further design studies. Radio astronomers will now wish to compare the scientific and financial advantages of NEROC with those of fixed spherical telescopes. But by knocking out the Caltech proposal for a conventional steerable telescope, NEROC has won the first round of the elimination contest.

Time for a Meal

Many activities of men and animals occur in regular 24-hour cycles, and in recent years biologists have recognized that a number of different stimuli control them. The passage of light and darkness is an obvious example. But it also appears that the body has internal biological clocks which manipulate the body's functions

on approximate 24-hour cycles quite independently of outside interventions. Recent work at M.I.T.'s Department of Nutrition and Food Science has thrown new light on these "endogenous" biological clocks, and the work also suggests an unorthodox approach to the problem of utilizing scarce food supplies.

Biological teams in many parts of the country have recently been studying the daily variation in the bodies of animals of an enyzme known as TT (tyrosine transaminase). This enzyme determines how much of the protein the animal eats is used for building up new tissue and how much is converted into fuel that the body burns. While several substances of the diet (such as sugars and fats) can supply the body's fuel needs, protein is unique and vital for the task of building tissue.

One of these groups, at the National Institute of Mental Health in Bethesda, Md., was led by Dr. Richard J. Wurtman, who came to M.I.T. in May of this year as Associate Professor of Endocrinology and Metabolism, and Dr. Julius Axelrod. In the June issue of the *Proceedings of the National Academy of Sciences* they reported finding that the activity of the enzyme TT in rats' livers varies by as much as 400 per cent throughout 24 hours.

Drs. Wurtman and Axelrod kept their rats in a controlled environment of 12 hours of light followed by 12 hours of darkness (the period of light starting in the early morning). They sacrificed their rats at different times during this artificial day, and found a consistent pattern of TT activity in their livers: at the beginning of the light period the activity was low; it rose gradually during the 12 hours of light and at the onset of darkness accelerated to four times the minimum level; through the dark hours activity fell back to the minimum.

Clearly, then, how efficiently a rat uses protein depends on the time of day at which he eats.

Does the same rhythm apply to man? Blood samples from M.I.T. volunteers showed that the amount of tyrosine (the constituent of protein whose breakdown TT catalyzes) in the blood stream does vary cyclically throughout the day.

The next question is more fundamental: Is the cause of this cyclic activity external or internal—in other words, does a stimulus outside the body or an internal biological clock control the activity of TT?

The obvious outside stimulus in this case might have been the intake of food: perhaps the protein in the diet caused blood tyrosine levels to rise, and this affected the TT. Dr. Wurtman found a heaven-sent opportunity to test this idea by plugging into another experiment at the Department of Nutrition and Food Science in which a group of nine volunteers was suffering a diet free from protein for 14 days. Blood samples from these volunteers showed in every case that the daily rhythm in the amount of tyrosine in the blood persisted. Hence, the intake of protein has no stimulating effect on TT.

It begins to appear, then, that the biological clock that determines the priorities for protein entering the body is indeed an internal one. This finding has wide implications for the supply of food to the hungry: nutritionists should aim to ensure that protein-poor peoples eat at those hours, determined by the activity of TT, when most protein will be channeled to the vital task of building up the body's tissues.

Lincoln Experimental Satellite, LES-5, is tested by Lincoln Laboratory prior to its launch in July. The first all-solid-state UHF-band communications satellite, LES-5 linked units of the three services in a unique communications program.

Military Get-Together



The three services are not noted for effective intercommunication in the political arena. When it comes to communications of the physical variety, however, the Army, Navy and Air Force have much more in common, particularly at the technical level. In July, units of the three forces demonstrated this competence when they conducted the first interservices communications by satellite, using the Lincoln Laboratory's Lincoln Experimental Satellite LES-5.

LES-5, the latest in a series of satellites built by Lincoln Laboratory for its Air Force-sponsored program in space communications, was launched simultaneously with five other satellites by a Titan III-C vehicle. It is now traveling in a near-synchronous orbit at an altitude of about 18,000 nautical miles, drifting eastward at a rate of about 30 degrees per day. Each orbit of the earth takes about 12 days, and the satellite remains in sight of any ground station for about five days. Individual stations can thus carry out extended tests on LES-5.

In the interservices communications experiment, aircraft from the Aeronautical Systems Division (Air Force Systems Command), Strategic Air Command, and Naval Air Test Center, a submarine from the Naval Underwater Sound Laboratory, a surface vessel from the Naval Electronics Laboratory, and ground terminals belonging to Rome Air Development Center, Army Communications Center, Naval Electronics Laboratory, Naval Air Test Center, Naval Underwater Sound Laboratory and Strike Command (Joint Army-Air Force) exchanged teletyped messages on the second and third days after the satellite was launched. Air Force Systems Command's Space and Missile System's Organization at El Segundo, Calif., managed the experiments.

LES-5, a cylindrical satellite five and a half feet long, four feet in diameter, and weighing 225 pounds, is the first all-solid-state communications satellite to operate entirely in the government UHF-band (from 225 to 400 megacycles per second), and the first communications satellite to transmit circularly polarized radio signals. Ground terminals can pick up its signals using very small antennas of simple design. These studies form part of a Department of Defense program aimed at developing communication via satellite between small moving terminals, instead of the bulky terminals used in present satellite communication.

Continental Jigsaw

In 1912, the German meteorologist Albert Wegener made the apparently preposterous proposal that the earth's continents had once been joined together. For the next 50 years the theory of continental drift was generally regarded by respectable geologists as no more than an interesting academic exercise for their more radical colleagues. But throughout 1967 a number of strands of evidence have coincided to suggest convincingly that continental drift is a fact of life on this earth. One of the stronger strands resulted from a joint project of geologists from the University of Sao Paulo, Brazil, and M.I.T.

A major foundation for the continental drift theory is the remarkably close fit between the coastlines of Africa and South America—a fit which becomes even more convincing if one considers the shapes of these continents at the 500-fathom mark. West Africa contains two major regimes of rocks: those to the west of a line through Ghana and Dahomey are approximately two billion years old, while those east of the line formed a mere 550 million

years back. The younger rocks form a series of belts, known as fold belts, which stops abruptly at the coastline. The international group, led by Patrick M. Hurley, Ph.D. '40, Professor of Geology at M.I.T., set out to discover whether the fold belts and the boundary between them and the older rocks continued into South America, assuming that the continents had once fitted together.

The team dated rocks from Brazil by two radiometric methods. Both showed conclusively that the boundary separating old rocks from young would have been continuous had South America and Africa been joined in a supercontinent. Reporting in *Science* (August 4, 1967) the team concluded firmly that "the evidence supports the hypothesis of continental drift." Other M.I.T. members of the group were Harold W. Fairbairn, William H. Pinson, Jr., Ph.D. '52, and J. R. Rand.

More recent studies have added credibility to their conclusion. The team identified a narrow belt of young rocks in the mouth of the Amazon and then found its counterpart along the West African Coast in an area previously believed to consist entirely of older rocks. And evidence is also emerging of a boundary line linking the Salvador region in Brazil with an area in Gabon.

Today, says Professor Hurley, geologists opposing continental drift have their backs to the wall. Recent seismic measurements have shown that some of the figures on which they based their opposition were wrong. This fact coincides with the new evidence of spreading of the ocean floors, polar wandering and the matching of rock regions to make the idea of continental drift almost irresistible.

Revolution in Medicine

Modern medicine is standing against the wall: as medical knowledge and the population both increase, medical practice will simply fail to meet its growing responsibilities. Superficial changes will not be enough; the entire system must be rebuilt, and technology must play a vastly greater role.

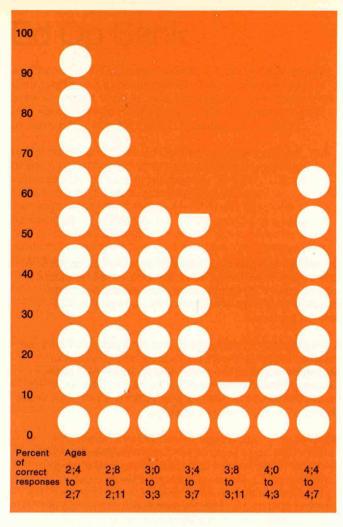
This urgent warning, and a blueprint for the new system of medical care which is now within man's vision, are the subjects of Dr. David D. Rutstein, Ridley Watts Professor of Preventive Medicine at Harvard Medical School, in a new book (*The Coming Revolution in Medicine*) published in October by The M.I.T. Press.

Quick and continuous assimilation of technological discovery are central in Dr. Rutstein's blueprint. Already many machines help the physician practice his profession, and Dr. Rutstein's goal for the future is to link these together into systems which will perform many of their functions without human intervention.

It is easy to foresee, he writes, that most laboratory tests will soon be performed by automated machines and the data processed by computer. But why not use a computer to sift and store these data? In making his diagnosis, today's physician compares available data with certain established patterns, selects additional data to be obtained, and finally confirms that all available data conform to the pattern of a single disease. Its speed, the reliability and capacity of its memory bank, and its precision in the matching of patterns all suggest to Dr. Rutstein that a computer can do the same job as well as or better than the physician. So he proposes that the physician should have on his desk every morning a "print-out" showing the results of tests ordered the day before (with abnormal results in capital letters and red ink), the present situation of all his patients, and some reminders which will help in diagnosing and specifying future treatments.

Dr. Rutstein also foresees feedback mechanisms to control blood pressure and other human physiologic functions and a vast increase in the use of machines to substitute for inoperative human organs. And modern technology and automation, "permitting many variables to be studied simultaneously, will revolutionize medical research and hasten the growth of medical knowledge." Indeed, Dr. Rutstein writes, "we can visualize the physical and engineering sciences becoming basic to the medicine of the future just as the biochemical sciences have in the recent past."

Dr. Rutstein's book derives special interest from his role as a principal architect of the new collaboration between M.I.T. and Harvard Medical School announced just before the book's October publication (see Institute Review).



Percentage of correct responses by children of different ages to the question of which of two rows of clay pellets contained "more." One of the rows contained six pellets and the other four; the pellets in the row of four were spaced further apart, to make the row appear the longer of the two. Children of two-and-a-half years neglected this experimental sophistication, and answered correctly that the shorter row with six pellets contained "more"; slightly older children, having learned something of the importance of outward appearance, often opted for the row containing four pellets.

Logic of Innocence

Do children possess an inherent capacity for logical thought, or do they acquire it by their experience of the world? Recent experiments at M.I.T. suggest that children can think more logically at two years old than they can at four, and these observations support the idea that children are indeed born with the ability to make logical choices. At the age of two they are innocent enough of the ways of the world to think entirely logically; by the time they are four they have gained sufficient experience of the world, that when logic and experience conflict, the children opt for the latter.

The M.I.T. work, to be reported in *Science* by Jacques Mehler and Tom Bever (who have now departed to the Laboratoire de Psychologie in Paris and Rockefeller University, respectively), extends to younger children the classic studies on children four years and upwards by the Swiss psychologist J. Piaget. At present, the work is in a fairly early stage.

In one experiment, an instructor shows a child two identical rows of four clay pellets. He then adds two pellets to one row, but moves the pellets in that row together so that they occupy less space than the unchanged row of four, and asks the child which row contains "more." Children between three-and-a-half and four tend to choose the row of four—the one that occupies more space. As they grow older, children learn to count the number of pellets in the row rather than accept external appearances.

Drs. Mehler and Bever questioned whether very young children would show the same concern for external appearance as the four-year-olds. Their doubts proved to be entirely valid, for children around two and a half years, faced with the same problem, correctly identified the row of six pellets as containing "more" in every case.

In fact the ability declines gradually with age between two and a half and four and a half (see diagram above).

Drs. Mehler and Bever conclude that this situation arises from the clash of inborn logic with experience of the adult world. The very young child has no experience to tell him that a row containing four pellets normally occupies less space than one containing six. The four-year-old, by contrast, has learned that longer rows contain more pellets as a general rule; since he cannot yet count, he assumes that the longer row in the experiment does contain "more."

The result of another part of the study suggests that children join the motivational race at a very early age. Instead of clay pellets, the children were shown rows of candies, and asked to take one row to eat. The older children who were tested performed consistently better in selecting the row which actually contained the larger number than they had with the pellets; possibly, Drs. Mehler and Bever suggest, children can overcome the perceptual strategy they have developed in the light of experience if they are given sufficient motivation to do so.

Exploding Milk?

Why is milk so stable?

Milk is an example of a colloid (a suspension of tiny particles in a liquid) which occurs naturally, and its individual particles, or micelles, can exist over a range of sizes. Artificial colloids, such as paint and mayonnaise, inevitably become precipitates in the course of time. This is one of the present barriers to the synthesis of milk. But a large step toward this goal has been achieved in recent studies at M.I.T. which have shown why the natural milk is stable over a range of micelle sizes.

Milk micelles consist of three different caseins (complex compounds of protein and phosphorus), labeled alpha, beta and kappa. The alpha- and beta-caseins combine in a number of clusters which are surrounded by a coat of kappa-casein at the micelle surface. The kappa-casein has an inert carbohydrate group attached to one end, and in the micelles' coating it is this group which is exposed to the surrounding fluid; hence the micelle as a whole is stable. The action of enzymes, however, can alter the kappa-casein and cause milk to curdle.

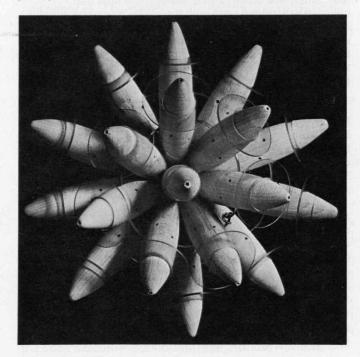
Many of these facts have come to light in a program at M.I.T. to investigate the colloidal properties of milk, headed by David F. Waugh, Professor of Biophysics. He reported his latest findings at the annual meeting of the American Chemical Society in Chicago in September.

Dr. Waugh and graduate student Bernard Talbot, Ph.D. '67, looked into the effect of adding kappa-casein to stable milk colloid. They found that the casein causes large micelles to split up immediately into as many as 400 smaller particles.

A detailed look at the types of chemical bonds which hold micelles together shows the reason for this behavior: Strong bonds keep the molecules of alpha- and betacasein in place in the individual clusters; however, the bonds between clusters in the micelles are relatively weak chains of calcium and phosphorus.

When excess kappa-casein is added to a stable milk colloid, the extra kappa molecules immediately make their way to the micelle surfaces, where they attempt to move into place. The weak bonds between clusters take up the strain of this process, and soon split asunder: the micelles split up into smaller pieces which provide the kappa-casein with greater total surface area on which to settle. It is for this reason that naturally occurring colloids remain stable with a variety of micelle sizes.

Dr. Waugh's program on the properties of milk parallels another on blood clotting. The studies on milk, a readily available biocolloid, have obvious significance to many biocolloids, such as blood, bone, cell membranes and protoplasm.



Cluster of alpha- and beta-casein—the basic unit of the colloidal particles in milk. A number of clusters linked together and surrounded by a coat of a third casein, labeled kappa, form the individual particles in milk. The caseins in the clusters are held together by strong chemical bonds, but the links between clusters are weak. When excess kappa-casein is added, these weak bonds cannot take the strain, and the particles break up into smaller units coated by the excess kappa-casein. This explanation of why milk is stable over a range of particle sizes may eventually lead to the synthesis of milk.

Ed Op Bank

An Educational Opportunity Bank to loan college students their tuition and expenses which they would later pay back through annual income surtaxes has been proposed by a special White House panel under the chairmanship of Jerrold R. Zacharias, M.I.T. Professor of Physics.

In a nutshell, under the Ed Op Bank plan any student, rich or poor, could borrow what he needed to pay college expenses for his bachelor's degree. He would pledge to pay back into the bank a certain percentage of his earnings, whatever they are, for 30 or 40 years after he completes his college work—the exact percentage and time period depending not upon the amount he earns but upon the amount he borrows. For a single man attending an inexpensive institution, the income surtax might be 1 per cent for 30 years; for a married couple both of whom attended expensive private colleges, the surtax might range up to 10 per cent of the joint income for 40 years.

Dr. Zacharias argues that the proposal substitutes for conventional loans a plan for students "to sell participation shares in their future incomes." Its purpose is to provide colleges with enough income to assure high quality by giving the beneficiaries of that high quality a reasonable way to pay the bill.

With financing of this kind available to all their students, Dr. Zacharias' panel suggested, colleges could increase their tuition charges so that the true costs of education were fully covered; then current giving and other income could be used for innovation and program improvement instead of for covering operational deficits.

The Ed Op Bank ran into immediate opposition from the "establishment." The National Association of State Universities and Land Grant Colleges and the Association of State Colleges and Universities called it "a system in which only the affluent would have access to higher education without entering into a life of indenture," and said it would destroy the concept of society sharing the cost of higher education by shifting the full burden to the student. The influential American Council on Education, noting that similar plans have been proposed earlier by others, said it seemed "inconceivable" that the Ed Op Bank plan could be taken more seriously than its predecessors have been.

In general, the Ed Op Bank seemed to favor the expensive, private colleges by giving their students a way of studying now and paying their high fees later. Public institutions feared that such financing for students would affect the institutions' public support. Dr. Zacharias at a Washington press conference said the panel believed that "people in the low-income brackets would benefit most."

"Present loan programs for students are not going well," he said. "Such a change in financing student expenses as the bank would provide is imperative. Higher education will be in deep trouble without it."

Dr. Zacharias' panel is advisory to Donald F. Hornig, Special Assistant to the President for Science and Technology. Harold Howe, 2d, Commissioner of Education, and Leland J. Haworth, Director of the National Science Foundation, joined in releasing the report "in the interest of stimulating general public discussion of new means of helping support higher education in this country."

Satellite Navigation

Navigation of satellites, both manned and unmanned, today relies on ground-based radar facilities; although on-board computers translate sightings directly into navigational instructions in many satellites, these computers must receive their initial bearings from the ground. Ground-based navigation has proved its reliability and accuracy in countless day-to-day missions. However, the possibility of clandestine launchings makes self-contained satellite navigation a desirable aim for military purposes. To this end, M.I.T. has recently received a contract to investigate the use of radiations in the earth's atmosphere as the basis of an on-board navigation system.

The program—Project PROFILE—is sponsored by the Space and Missile Systems Organization, Air Force Systems Command, El Segundo, Calif., which has allocated \$1,500,000 to the Instrumentation Laboratory. The work will lead to two satellite experiments, each measuring infrared and ultraviolet radiations in the atmosphere. Currently, the two launches are scheduled for July 1, 1970, and March 1, 1971; each mission will last 14 days.

A self-contained orbital navigation system for long-term missions, based on present-day earth sighting methods, would give a satellite's position to an accuracy of no more than 10 to 20 miles. Sightings taken in near-earth orbit use the horizon as a reference; owing to the atmosphere this is not a clear-cut line, and in fact cannot now be sighted accurately to better than half a minute of arc. Project PROFILE aims to develop a method of sighting based on the clearer definitions of radiations in the atmosphere.

The most promising radiation for this purpose, according to theoretical studies, is that emitted by carbon dioxide molecules at the infrared wavelength of 15 microns. The concentration of carbon dioxide in the atmosphere varies remarkably little with altitude, and a knowledge of the intensities of the 15 micron emissions throughout the atmosphere could possibly provide the basis for an accurate reference system for on-board sighting.

The two PROFILE satellites will plot the intensities of these emissions (and also of ultraviolet emissions at 0.3 micron wavelength) at different altitudes and times throughout the day. While the satellites are in orbit, the project engineers will also be measuring weather conditions; combinations of the plots from the two flights with meteorological observations over a period of one or more years spanning the flights will then give an accurate picture of the variation in emissions with seasons of the year.

As part of a budget-conscious program, the satellites' sensing equipment will be referenced to refurbished and

modified inertial measurement platforms to be used this fall in unmanned flight tests of the Apollo project. A star tracker aboard each satellite will provide the inertially-referred pointing information to pinpoint the orientation of the radiometer lines of sight at any time. Ground radars of the Air Force Satellite Control Facility Network will track the satellites, to determine the spatial position of the sensors with respect to the earth at all times.

Combining the satellite readings with meteorological observations will give a model from which engineers can plot the profiles of the emissions as functions of altitude, time of day and time of year. These profiles will then lead to designs for equipment capable of using the emissions as references for on-board navigational fixes.

According to Glenn Ogletree, S.M. '61, PROFILE Project Leader, although Project PROFILE is a sound engineering solution to the key (earth pointing) problem in developing accurate, long-term, self-contained orbital navigation, such navigation cannot presently be identified as the solution to military operational requirements for which systems development funding is provided. Therefore, in common with many other space programs for which immediate operational need is not established, Project PROFILE faces a budgetary fight for existence. In view of this situation, and the present mood of federal economy, it appears that 1970 may be a very optimistic date for the first PROFILE launching.

Smoke rings from model experiments in the laboratory may foreshadow a large-scale process to reduce air pollution. Timothy Fohl, Ph.D. '63, suggests that smoke blown from factory chimney stacks into the atmosphere in rings will ascend to much higher altitudes than the conventional plumes of smoke. The higher in the atmosphere the smoke finally disperses, the less likelihood it has of adding to the air pollution at the surface.

Smoke Rings

Ragged plumes of smoke ascending slowly from high chimney stacks to mix with the atmosphere typify the popular picture of a city with air pollution problems. And it is certainly true that in still conditions only the plumes from the tallest stacks can reach the relatively clean air at high altitudes; smoke from lower stacks seems destined to add to the general pollution.

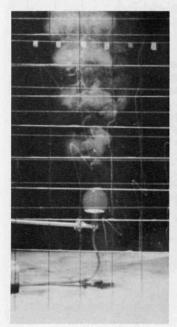
A possible method of overcoming this problem without the expense of building very tall stacks has emerged from studies on vortex rings in gases: smoke rings on a large scale may prove an inexpensive means of reducing factory-induced air pollution. This is the suggestion of Timothy Fohl, Ph.D.'63, of Mount Auburn Research Associates, Inc., who is also a research affiliate at M.I.T.

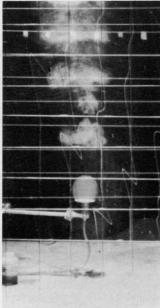
Dr. Fohl has shown that smoke rings emitted from stacks at intervals rise much higher than the continuous plumes, because their shape causes less mixing with the atmosphere. The rings thus reach much higher altitudes, and cleaner air, than do the plumes.

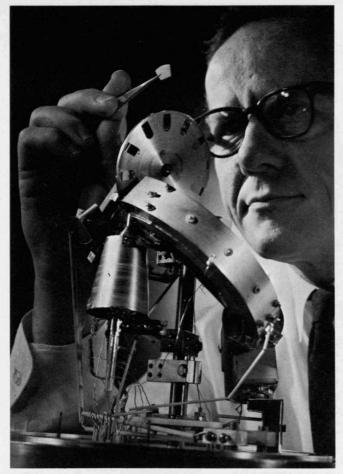
Clearly a smoke-ring scheme would affect the design of chimney stacks. Dr. Fohl suggests that the rings could be produced either by a piston drawing gas into the stack on the down stroke and expelling it on the upstroke, or by a shutter arrangement which alternately compresses and releases the gas.

Neither system would require a stack more than about 20 feet high, Dr. Fohl told *Technology Review*. And such stacks operating from ground level would shoot their effluents as high as 1,000-foot stacks of the conventional variety, given sufficient power.

Dr. Fohl estimates that the cost of stacks to blow smoke rings would be far lower than the conventional stacks. Against this, however, must be placed the power required to emit smoke rings—a running cost not encountered in normal stacks. However, even when the smoke rings are to be shot to altitudes as high as 15,000 feet this amounts to only a few per cent of the waste heat that the stack emits.







Lawrence A. Harris, Sc.D. '50, sets up a piece of molybdenum for surface analysis by secondary electron spectroscopy. This new method, developed by Dr. Harris, is more sensitive than other techniques now available, and has particular application to analysis of relatively light elements.

Analyzing Surfaces

X-ray analysis of the surfaces of solids is relatively difficult in the case of the lighter elements such as lithium, beryllium, boron, carbon, and oxygen. This major disadvantage is absent, however, in a new analytical technique using an electron beam, developed by Lawrence A. Harris, Sc.D. '50 (above), of the General Electric Research and Development Center in Schenectady, N.Y., and reported this summer at a University of Denver research conference.

In Dr. Harris' method, known as secondary electron spectroscopy, a solid sample is placed in the path of a beam of low-energy electrons. When struck by the beam, atoms at the surface of the sample themselves emit electrons; the energies of these are characteristic of the element producing them. The energies of the secondary electrons are measured electronically, and so the impurities present in the solid surface are identified.

The new method can detect atoms in surface concentrations of less than a tenth of a microlayer; it can also detect impurities of less than 10 parts per million when impure atoms collect together on a surface. Dr. Harris' work has shown that secondary electron spectroscopy will be of value in identifying contaminants in solids in the laboratory and in operations requiring very pure components.

Future of Magnetism

"The nation that controls magnetism will control the universe" reads the caption above the Dick Tracy cartoons. Professionals in magnetism are generally less optimistic about their subject, but they do believe that it will soon stimulate important advances in fields as diverse as computers, high-energy physics and medicine. These predictions came from a panel of scientists briefing science writers before the International Congress on Magnetism in Boston in the early fall.

Albert M. Clogston, '38, of Bell Telephone Laboratories set the scene with a description of the history of magnetism up to 1928, the year in which P. A. M. Dirac unified quantum theory and relativity in his relativistic theory of the electron. He reminded his listeners that Faraday, perhaps the most significant figure in the history of magnetism, had died almost exactly 100 years previously.

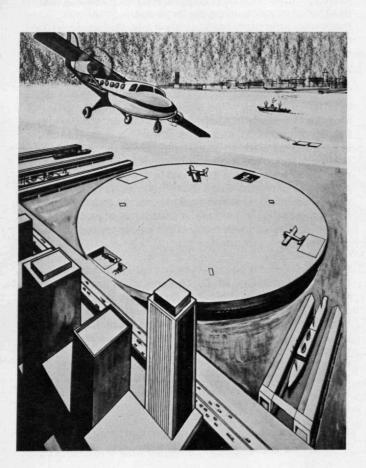
It fell to Herbert B. Callen, Ph.D. '47, of the University of Pennsylvania to explain the theory of magnetism. Although solid state physicists now understand a great deal about magnetism on the large scale, they have made very little progress in really basic studies. Even the most fundamental theoretical problems are often too complex in terms of quantum mechanics for physicists to understand them fully.

The next speaker, Robert Street, wore a number of hats. Normally Chairman of the Department of Physics at Monash University in Australia, he is currently a Visiting Professor at Oxford, and at the time of his appearance in Boston was working as a Visiting Scientist at Ford. He explained to the assembled science writers the use of magnetic properties of materials to probe the basic properties of matter. Such techniques as nuclear magnetic resonance, electron spin resonance and hyperfine fields depend on the magnetic properties of matter, but are used to investigate many other inherent properties of materials.

Magnetic applications on a larger scale formed the subject of Benjamin Lax, Ph.D. '49, Director of the National Magnet Laboratory at M.I.T., who also chaired the proceedings. Superconducting magnets are already in use in bubble chambers, he told the science journalists, and have great potential for future uses in accelerators, plasma physics and magnetohydrodynamics. Dr. Lax referred to medical work by D. Bruce Montgomery, '56, who has developed a method of moving magnetic particles through veins or arteries to remove obstructions from these vessels. The Weizmann Institute in Israel is also carrying out interesting work in the medical field. One team has developed a magnetic contrast material for x-rays to take the place of the familiar barium sulfate,

while another has developed the idea of including some magnetic material in intra-uterine contraceptive devices; women could check that their IUD had not slipped out by standing in front of a simple magnetometer.

What is magnetism's future? Charles P. Bean of General Electric Research and Development attempted to forecast a few broad trends in the field. The most important future applications, he said, will come in computers; ferrite cores are already proving their worth in computer memories, and the future may see alternative means of addressing memories, such as the use of magneto-optical effects. Dr. Bean also forecast important, though not necessarily spectacular, advances in power generation as a result of advances in magnetism. And at a more fundamental level, scientific groups continue to search for the single magnetic pole; Henry H. Kolm, '50, of the M.I.T. National Magnet Laboratory is among the seekers. If single magnetic poles exist, Dr. Bean concluded, they would be sources of vast energies.



Floating Airports

While New York City and its environs are desperately short of building land, there remain large tracts of traffic-free water. A study underway at Rutgers, the State University of New Jersey, aims to test the possibility of putting this to advantage in urban transportation, through the use of floating airports.

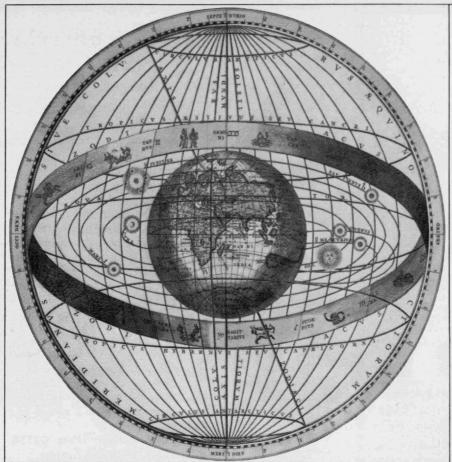
The study, started in November, 1966, by Edward G. Nawy, C.E. '59, and Cooper B. Bright, had the initial task of determining the technical and operational feasibility of floating airports which could provide adequate runways and service facilities for a fleet of vertical and short take-off aircraft. The investigators decided that circular, cylindrical airports would best fit the specifications. Their resulting design, known as the Rutgers Aquadrome, would allow aircraft to take off and land in any direction; aircraft could thus operate from the aquadrome in all wind conditions.

The shallow draft of the aquadrome gives it access to water areas close to urban centers, including rivers, lakes and tidal estuaries. And at an estimated cost of 5 to 10 million dollars, it is much less expensive to construct than the orthodox airport, even when one neglects the considerable saving in land purchase.

A typical aquadrome (see picture) has a radius of 1,000 feet, an inside height of 16 feet, and a draft of 12 feet. In service the top side of the cylinder will act as the flight deck, and the bottom of the cylinder, below water level, will be the hangar deck, containing terminal and supporting facilities.

The investigators chose reinforced concrete as the ideal material for the aquadrome; they are currently testing models of microconcrete aquadromes to failure, to evaluate the reaction of the material to the manifold stresses it will encounter in practice. They hope that a real aquadrome will be towed to a permanent position near the lower tip of Manhattan in 1969.

The Rutgers Aquadrome, a new concept to aid mass transportation in large cities, resulted from a study by Edward G. Nawy, C.E. '59, and Cooper B. Bright of Rutgers University. The cylindrical airport, to be built of reinforced concrete, will provide takeoff and landing facilities for V-STOL aircraft on its top deck, and terminal and supporting facilities on the lower deck, below water level.



Engineers, scientists: otherworld, upperworld, subworld, wideworld projects demand the best talents on earth.

Lockheed Missiles and Space Company is seeking men of exceptional ability to undertake vital engineering projects. A great many new positions recently have been created by research and developmental programs . . . programs with farreaching implications for the technological advancement of this country.

LONG-TERM PROJECTS-Among the projects that can be mentioned here are: Agena. Future missions will require major modifications to the Free World's most versatile and reliable space exploration vehicle. These missions demand significant advances in a number of technical areas. Agena, but one example of Lockheed's

outer space programs, recently

was awarded a large, new contract. Polaris. Now undergoing extensive alterations, this submarine fleet ballistic missile remains the Free World's foremost deterrent force. To extend its deterrent capabilities further, considerable engineering challenges must be overcome. Poseidon. State-of-the-art engineering problems never before encountered in an ICBM must be solved during

development of this eventual successor to Polaris. Information systems. Projects under way will help hospitals,

corporations and governments efficiently manage exploding masses of information.

Unique land vehicles. Developing advanced-capability vehicles, such as Twister, gives Lockheed engineers opportunities to employ unusual solutions. Deep Quest. This research vehicle is part of Lockheed's corporate commitment to pioneer in the undersea world. Among its missions will be a detailed exploration of the ocean floor. Specifications call for a payload capacity of 31/2 tons, and a submergence duration of up to 48 hours.

DSRV. The Deep INFORMATION S Submergence Rescue Vehicle is the first of a fleet of mercy ships. Other 5 Lockheed undersea projects range from

imaging systems to bioaquanautics.

MOST FIELDS OPEN-Whatever your field, if you can handle difficult technical assignments, the chances are that Lockheed has a career waiting for you. The afore-mentioned projects, plus many others, involve nearly every engineering and scientific discipline, and at practically all levels. In Systems Engineering,

Lockheed needs

people to work with computer systems, reentry systems,

information systems and others.

In Development Engineering, openings involve: space vehicles, missiles, ground vehicles, undersea vehicles, plus all phases and types of electronics.

For Aeronautics and Astronautics, Structures, Electronics, Civil Engineering, Computer Sciences, Manufacturing Engineering, Mechanical Engineering and Product Assurance people, assignments encompass analysis, design, development, coordination, programming and integrating functions.

IDEAL CONDITIONS-If you feel quali-

fied to meet the constant demands of advanced programs contact



Lockheed. The atmosphere is productive. The assignments, stimulating. The work, satisfying. The challenge, never-ending. At Lockheed, you will live in the Santa Clara Valley, an area near-perfect. Only an hour's drive from cosmopolitan San Francisco.

Educational opportunities are outstanding. Three leading universities, plus dozens of colleges are nearby. Lockheed sponsors several educational programs to help you continue your learning, obtain advanced degrees, keep up with state-of-the-art advances.

Write today for information to: Mr. R. C. Birdsall, Professional Placement Manager, P.O. Box 504, Sunnyvale, California 94088. An equal opportunity employer.



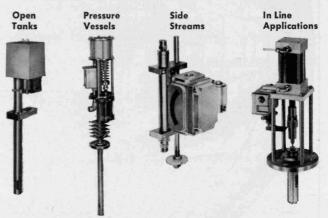
NORCROSS Viscometers



RECEIVERS

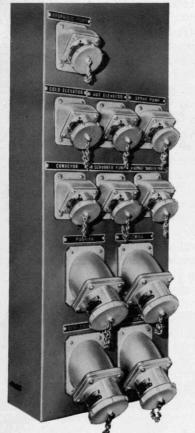
Indicating or Recording
Electric or Pneumatic Control
High and Low Alarms
Electric Output for Data Processing

MEASURING ELEMENTS for



Austin S. Norcross, '29 Frederick J. Elmert, '32 Robert A. Norcross, '51 for full details write Dept. A-69

NORCROSS CORPORATION Newton, Mass. 02158
Representatives in Principal Cities and Foreign Countries



Power-Hungry Industrial Machines and Equipment Rely on Ralco High Amperage Connectors

Rugged is the best way to describe Ralco electrical connectors which now complement Hubbell's broad line of quality wiring devices.

These Ralco products extend Hubbell's connector line through 100 amperes. Thus, our capability is expanded to encompass applications such as power connectors for railroad cars, baking and industrial heating equipment, welding machines, truck refrigerators, etc.

The addition of Ralco products is another example of Hubbell diversification to meet industry's ever-expanding need for dependable power connections.

HARVEY HUBBELL INCORPORATED

Bridgeport, Connecticut 06602

RUGGED ELECTRICAL WIRING DEVICES • COLD FORMED MACHINE SCREWS AND SPECIAL FASTENERS • CUSTOM MOLDED PLASTIC PARTS • OUTDOOR LIGHTING FIXTURES • MECHANICAL HOLDING DEVICES • INDUSTRIAL CONTROLS



Unsinkable...

Unburnable... till human error proved otherwise!

Many companies write property insurance. So does Manufacturers Mutual. Much more important, Manufacturers Mutual concentrates on Property Conservation. This never-ending educational process helps eradicate human error. Actively supported by management, and applied at every personnel level, it can assist you in protecting property and profits. We'll be glad to help.

Manufacturers Mutual Fire Insurance Company 1500 Turks Head Building, Providence, R. I. 02901



MAIN

CHAS. T. MAIN, INC.

Engineers

• Studies and Reports • Design • Construction Management

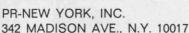
Industrial Plants • Textile Mills • Pulp and Paper • Graphic Arts • Thermal Power • Hydroelectric Power • Power Transmission • Nuclear Facilities • Industrial Process

441 STUART STREET, BOSTON, MASS. 02116, TEL. (617) 262-3200 1301 E. MOREHEAD ST., CHARLOTTE, N.C. 28204, TEL. (704) 375-1735

Public relations representation in New York on a dignified, professional and practical basis.

Brochure available.

James H. Kennedy '50, President



(212) 867-4550



Designed and Manufactured to meet

YOUR

Production Requirements

Custom Gears Exclusively



GEAR CORPORATION

SYRACUSE 1, N. Y.



Aerofin, the industry pacesetter, offers the widest possible range of fan-system-engineered hot and chilled water, steam, direct expansion, booster, SMOOTH-FIN coils. So why specify over or under your exact requirements?

Aerofin's close-fin spacing produces optimum heat-exchange capacity in unusually compact space. SMOOTH-FIN design coils have a low airside friction factor — yet are completely compatible with modern high-duct velocities. Need coil application help? Your Aerofin man has the answer.

AEROFIN CORPORATION

Lynchburg, Virginia 24505

Aerofin is sold only by manufacturers of fan system apparatus.

List on request.

AEROFIN OFFICES: Atlanta · Boston · Chicago · Cleveland · Dallas · New York · Philadelphia · San Francisco

Some of the best engineers we had in 1966 are now sitting behind doors like these...











interested?

These specifics should interest you even more. In the first four months of this year, this was our engineering promotion record: Seven engineers moved up to Manager; another six advanced to Section Head. And, ten others were promoted at least one notch on the organizational chart. Two points should be considered in evaluating this brief statistic: First, the figures cover only one-third of the year. Second, it's typical.

Undoubtedly a contributing factor to these outstanding advancement opportunities is the fact that we are the R&D and manufacturing arm of ITT in the area of electronic equipment and systems. This puts our engineers in the forefront of such programs as TACAN, LORAN, OMEGA, ILS, DME, ECM, Sonar Recording Systems, Acoustic Pingers, Electronic Trainers and Simulators. One of the more challenging current projects involves the integration of electronic countermeasures on a real time basis. Some other programs are listed to the right-all require the ahead-of-the-art thinking that merits ahead-of-the-norm promotions—both vertically and horizontally.

Opportunities in design and development, using state-of-the-art techniques such as solid state, microelectronics and integrated circuitry, exist on the following projects:

- Tactical Air (TACAN), Long Range (LORAN) and Global (OMEGA) Navigation
 - Sonar Recording Systems
 - **ASW Tactical Team Trainers**
 - Acoustic Countermeasures
- Direction Finding Equipment
- Reconnaissance and Surveillance
- Advanced Electromagnetic Warfare
 - Airborne Digital Computers
 - Aerospace Ground Equipment
 - Digital Systems and Displays
 - Special Purpose Computers

The door that opens on all these oportunities is located at

Nutley, New Jersey. To set up an appointment please write Robert T. Lehman, Manager of Employment, ITT Avionics, Room 400-W, 390 Washington Avenue, Nutley, N.J. 07110. All inquires will be answered.



A Plans for Progress Equal Opportunity Employer (m/f)



Institute Review

Cities in Crisis

The panorama of urban problems extends from prehistory to modern times, from central-city ghetto to exurb estate. For 300 alumni and their wives who spent the second weekend in September at the 1967 Alumni Seminar, it is a panorama with both despair and hope.

The seminar's theme, Cities in Crisis, is timeless. Arthur R. Steinberg, Assistant Professor of History and Archaeology at M.I.T., turned to the ancient Middle East to show that man's earliest cities were born of conflict. The "exploitation of tension," he said, "gives the city its dynamics of growth."

John E. Burchard, '23, Mellon Visiting Professor in the School of Environmental Design at the University of California (Berkeley), recalled with special modern emphasis Napoleon Bonaparte's lament that "wars never left to our kings the time and money to make our cities great."

But never before have cities been as complex, or their crises therefore as Herculean. The modern city, said Leonard J. Fein, Associate Professor of Political Science, in the seminar's most eloquent address, is divided by invisible walls that separate black from white, rich from poor. "Now at last," he said, "we are informed with words and cries and fire and death that our comforting tradition will do no more, that the walls must be torn down in one massive stroke, that we have not the right to appoint ourselves quardians of the passage. We are told that our simple ethic, holding that any man who could deserve our world would be welcomed to it, is cheap and insufficient, patronizing-unacceptable."

Our progress is blocked, too, by conflicts between federal and local interests, metropolitan and sub-city blocs—and by the fact that, in the face of these conflicts, our national goals are "incompatible" with local management, said Bernard J. Frieden, Ph.D.'62, Associate Professor of City Planning at M.I.T.

But despite these discouraging views, members of the seminar were also given reasons for optimism.

Robert C. Wood, Under Secretary of Housing and Urban Development, told the group that "the potential for citybuilding in the United States grand in scale and fine in quality has never been greater. We are in fact further along in understanding the urban system, in developing the capabilities to direct it, and in deciding in what direction it should go than most Americans appreciate," he declared.

Eight M.I.T. students who worked last year in an interdepartmental course to design a new city for 100,000 in one square mile devised a housing system which would "take the discomfort out of change." Thus members of the seminar discovered that original effort applied to urban problems by undergraduate and graduate students can result in an outburst of creative achievement.

William L. Hooper, '57, of the Office of Science and Technology in Washington described several down-to-earth innovations in prefabricated and mobile housing, including some that promise to cost less than \$10 per square foot. "In spite of roadblocks to the introduction of new housing concepts," he said, "fertile minds have generated interesting and novel approaches" and the time is coming, he declared, when "the rewards of utilizing technological and institutional innovations will become so attractive that the edifice of traditions will begin to crumble."

Another optimist among the speakers was Kevin A. Lynch, '47, Professor of City Planning, whose vision of the city of tomorrow fulfilled his promise that "metropolitan growth is a magnificent opportunity for the improvement of our society." He emphasized that a well-planned city should be an "educational environment which offers a rich variety of experience within the scope of daily life."

Moshe Safdie, the architect of Habitat, the housing system on view at Expo '67 in Montreal, said its greatest contribution has been its "challenge of our preconceptions and methods." There is "unforgiveable arbitrariness" in the design of many buildings today and broad disregard of function as the basic source of a building's shape and style, he said.

The seminar ended with a lively controversy at the traditional panel discussion moderated by James R. Killian, Jr., '26, Chairman of the M.I.T. Corporation. The argument arose when Kenneth Clarke, Professor of Psychology at the City University of New York, declared that college professors "spend a great deal of their time training out of our students a sense of social relevance." The universities, he said, have a long history of default on important moral issues because they

have made a virtue of their ivory towers. Other panelists denied that contention. The difficulty, said Walter A. Rosenblith, Chairman of the M.I.T. Faculty, is often that "problems in the real world do not come with departmental labels." And Charles Abrams, Chairman of the Division of Urban Planning at Columbia University, emphasized the many ways in which urban universities are involved with their communities, despite many inherent sources of conflict.

M.I.T. and the City

A growing commitment from M.I.T. to help solve modern urban problems and to "capture the energies and vitality of the urban process" was announced by Howard W. Johnson, President of the Institute, at the opening luncheon of the 1967 Alumni Seminar.

It will be a new program, he said, "at a wholly new level of performance, for mobilization of M.I.T.'s special and in many ways unique resources toward the solution of the present urban crisis."

The program, he said, is to have three elements:

- 1. The transfer of technical and social information arising in industry to help meet urban needs, through establishment at M.I.T. of an urban systems laboratory and a new "urban information bank." 2. New, intensive research in certain areas where technology is not highly developed and knowledge sorely lacking, among them housing, public education, and metropolitan finance. Indeed, said President Johnson, "we know more about the DNA molecule than the neighborhood, more about magnetohydrodynamics than about urban renewal, more about photosynthesis than about municipal services."
- 3. Establishment of a program of Fellows in Urban Affairs, to give young men experience with urban problems and to encourage professionalism of metropolitan management. The concept is not unlike the program of the M.I.T. Fellows in Africa established in the Sloan School of Management at M.I.T. when Mr. Johnson was its Dean.
- "Our purpose," President Johnson told more than 300 alumni at the Seminar, "will be to unleash the energies of this institution in ways that will benefit the city." At the same time, he said, the growing involvement of M.I.T. in urban problems will enhance the Institute's intellectual product.



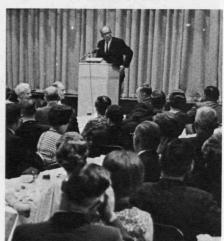












Highlights of the 1967 Alumni Seminar (left to right, top to bottom):

Howard W. Johnson: We know that crisis-ridden cities must be transformed--"if not now, when? If not here, where? If not we, who?

John E. Burchard, '23: Napoleon pondered Paris as we ponder Detroit: Can we at once fight wars and build great cities?

Irwin W. Sizer: "The changing city is the key, and we must restore it to man's service."

Arthur R. Steinberg: Even ancient cities, buried 14 deep in the Middle East, reveal that conflict has always been a way of urban life.

James R. Killian, Jr., '26: The university's role is to make clear those "principles which bear upon man's high standards and lofty purposes."

Robert C. Wood: "... how to rediscover community on a larger scale . . . Where are our new village greens and town commons?"

The City—Present and Future

Urban technology and Boston politics came together at M.I.T. in late July, in the shadow of the Newark and Detroit riots. The occasion was a conference on "Housing and Urban Redevelopment in the United States" sponsored by the Association Internationale des Etudiants en Sciences Economiques et Commerciales (A.I.E.S.E.C.), an international body of students in economics and business: among the star attractions were Robert C. Wood, on leave from M.I.T.'s Department of Political Science as Undersecretary of the U.S. Department of Housing and Urban Development, and Edward J. Logue, who was winding up his term as Development Administrator of the Boston Redevelopment Authority to devote his full time to campaign for Mayor of Boston.

Mr. Logue lamented the lack of federal money for urban renewal and urged the government to consider cutting down on space expenditure to create funds for the down-to-earth tasks.

"What we want from the federal government," he stated, "is money, and as little advice as possible." He called for an internal revenue code which encourages landlords to keep their property presentable.

The second speaker, Malcolm E. Peabody, Executive Director of the Interfaith Housing Corporation, laid the blame for the country's slums squarely on the Horatio Alger attitude. "Today," he said, "there are no bottom rungs on the economic ladder. Until the nation realizes fully the bitter injustice perpetrated by the Horatio Alger myth, we will proceed from riot to riot to riot."

Two contributions later in the conference anticipated future promise rather than present chaos. Bruce P. Hayden, Vice President of Connecticut General Life Insurance Co., discussed the birth of Columbia, the new town located between Washington and Baltimore. This city, funded by the Connecticut General and designed by a panel of 14 experts in social science, psychology, transportation and other relevant disciplines, is perhaps a prototype for cities of the future. It will consist of a town center and nine satellite villages, each of which will consist in turn of five or six neighborhoods based around a local primary school. Traffic patterns will be arranged so that no child has to take a bus or cross a major road on his way to school, Mr. Hayden told A.I.E.S.E.C. delegates.

As wind-up speaker, Dr. Wood tackled the complex problem of the roles of government, universities and business in housing and urban redevelopment. The United States, he said, is a late starter in the urban game, having resisted until very recently the notion that it is indeed an urban people. But now the problem takes the form of an emergency; the country has only three to five years to solve it before the postwar baby boom leads to utter chaos. It is the hope of Dr. Wood's de-

partment that a reduction in the cost of building houses will give some impetus to the solution of perhaps the most serious of the country's internal problems.

Delegates to the conference also heard details of the Renewal Program of the Christian Science Mother Church in Boston, attended a reception hosted by Daniel Hayes, Mayor of Cambridge, participated in panel discussions on urban affairs, and sensed the flavor of local politics in a tour of Boston redevelopment areas, led by B.R.A. guides sporting 'Ed Logue for Mayor' buttons.

Information Processing

The broad character of M.I.T.'s burgeoning computer enterprises has now been recognized with the appointment of Richard G. Mills, '54, to be Director of the Institute's Information Processing Services.

In announcing the appointment, President Howard W. Johnson noted that while M.I.T.'s Computation Center has been in the process of continuous expansion since its founding in 1956, there have also developed on the campus many other computers of different sizes serving different needs. Some of these, he said-notably those at the Laboratory for Nuclear Science, Electronic Systems Laboratory, Project MAC, and the Sloan School of Management—are themselves major installations and interact with one another and with the central facility.

"It is therefore essential," said President Johnson, "that the growth and development of the overall information processing capability of the Institute proceed under a carefully coordinated and unified plan, within which the individual installations can be mutually supporting." To develop and operate this concept is Mr. Mills's assignment.

Mr. Mills studied electrical engineering and management at M.I.T., was associated with the Whirlwind I computer as an undergraduate, and returned to the Institute in 1963 to join the staff of Project MAC, of which he is currently Assistant Director.



Richard G. Mills, '54



John M. Wynne, S.M.'56

Organization Systems

President Howard W. Johnson has created a new M.I.T. administrative post of Vice President—Organization Systems

and has appointed John M. Wynne, S.M. '56, formerly Associate Dean of the Sloan School of Management to fill it.

Mr. Wynne's assignment is to provide staff support to the principal Institute officers in studies to improve administrative organization, to develop effective internal communications, to advance M.I.T. planning efforts, and to evaluate other internal processes-in short, to improve the Institute's administrative system.

In announcing the appointment, President Johnson recalled M.I.T.'s recent rapid growth. "The size of our educational program, the costs implicit in it, the growing need for administrative support for all of our activities, and the expectations we have for new activities and for improving our present ones over the years ahead, he wrote to the faculty, "make the need for this new function apparent."

Mr. Wynne first came to M.I.T. in 1956 with a Sloan Fellowship for advanced study in the Sloan School of Management; he returned two years later as Director of the School's Executive Development Programs, and in 1961 he became Associate Dean. From 1946 to 1958 he was associated with the Sacramento Air Materiel Command, where he was chief civilian executive when he came to Cambridge for graduate study at the Institute.







Roy A. Johnson, '50

Alumni Fund Directors

Robert Hagopian, '47, and Roy A. Johnson, '50, have joined the Alumni Association staff as Associate Directors of the Alumni Fund.

Mr. Hagopian will be concerned especially with geographical organization of Fund activities, and Mr. Johnson's special assignment is with the fund-raising efforts of reunion classes, according to Kenneth S. Brock, '48, Director of the Fund, who announced the new appoint-

Douglas F. G. Haven, '52, who has been Associate Director of the Fund since 1959, has left the Alumni Association to join private industry.

Mr. Hagopian comes to M.I.T. from the American Insurance Association in New York City, where since 1951 he has been Administrative Director of Industrial Safety Services, coordinating individual companies' safety engineering activities, evaluating legislation and regulations,

and administering an extensive publications and public relations program. His M.I.T. degree is in civil engineering, and he holds a master's degree in safety engineering from New York University (1954). He is a registered professional engineer in New York State.

Mr. Johnson attended M.I.T. in 1946-48, when he transferred to North Central College to study for the ministry. Later he attended Chicago, Evangelical, and Bethany Theological Seminaries and received the S.T.M. degree from Andover Newton Theological School in 1959. He was pastor of the interracial Lower Miami Church of the Brethren in Dayton, Ohio, for four years before becoming Chaplain at Elizabethtown College, Pa.

A Record Alumni Fund

For the fourth consecutive year, the M.I.T. Alumni Fund has set new records as shown in the paragraphs which follow.

In the 1967 Fund, the record totals were \$2,532,039 made possible by the gifts of 17,545 alumni, according to the final report of Philip H. Peters, '37, Chairman of the Alumni Fund Board.

The highest previous totals were \$2,210,356 from 16,272 alumni, to the 1966 Fund.

In a letter to Mr. Peters, Howard W. Johnson, President of M. I. T., called the report "exhilarating news."

"The Fund results," he wrote, "are an eloquent manifestation of the loyalty our alumni have for M.I.T. Their gifts help us to go forward with the programs that maintain and enhance M.I.T.'s position as one of the leading universities in the world."

Theodore A. Mangelsdorf, '26, President of the Alumni Association, wrote alumni that their support has made the Fund's annual giving program "one of the top five in the country." The five-year glfts of the three major reunion classes—1917, 1927, and 1942—were "breath-taking," Mr. Mangelsdorf said: \$897,685 from the 50-year Class of 1917, a record; \$422,589 from the Class of 1927 (including fifth-year record of \$96,338 with 58 per cent participation); and \$202,150 from the Class of 1942.

Top ranking in 1967 Alumni Fund participation was the Class of 1905 (Robert W. McLean, Class Agent), 66 per cent of whose active members gave to the Alumni Fund. Runners-up were the Classes of 1911 and 1917 (64 per cent), 1899 and 1913 (63 per cent), and 1916 (62 per cent). The Class of 1926 (Chenery Salmon, Class Agent) topped all others with total Alumni Fund giving of \$230,462.

On a regional basis, Muncie, Ind. (Karl L. Ford, '18, chairman), Newport News (Edward R. Tilburne, S.M. '39, chairman), and Alameda County, Calif. (Myron S. Huckle, '30, chairman) claimed high honors for the number of donors. Runners-up included Monterrey, Mexico (Eliot Camarena, S.M. '44, chairman), Lexington, Ky. (George W. Smith, Jr., '47, chairman), Corning, N.Y. (Charles B. King, Ph.D., '40, chairman), Park Forest, III. (Donald E. Grimes, '58, chairman); and Rochester, N.Y. (John D. O'Brien, '51, chairman).

The Mayor Comes to M.I.T.

John F. Collins, Mayor of Boston, will join the M.I.T. Faculty upon completion of his second term as Mayor of Boston on January 2, 1968.

The announcement of Mayor Collins' appointment stunned his political colleagues and made national headlines. Howard W. Johnson, President of M.I.T., said he will bring to the Institute "a keen knowledge of urban problems and the complexities of managing a city.

"His broad experience is certain to enrich the education of our students and to aid in finding solutions for urban problems in this country," said President Johnson. James R. Killian, Jr., '26, Chairman of the M.I.T. Corporation, added that Mayor Collins' appointment reflects M.I.T.'s "deep commitment" to "broad solutions to the problems of a metropolitan community."

In his turn, Mayor Collins responded by calling for a national effort "by every segment of our nation, unprecedented in domestic America, to save our cities.

M.I.T. with its vast reservoir of expertise and resources can be a focal point in this endeavor," the Mayor said, "and I look forward to an opportunity to play a role."

Mayor Collins will be Visiting Professor of Urban Affairs; through the Institute's interdisciplinary organization, he will be affiliated with urban studies in the Departments of Political Science and Civil Engineering and in the Alfred P. Sloan School of Management. And, because all M.I.T. Faculty members are encouraged to devote part of their time to private professional activity, Mayor Collins will serve as an urban affairs consultant and lawyer, making his talents available throughout the country, according to the Institute announcement.

Mayor Collins' leadership of Boston is widely respected and applauded. He has been President of the National League of Cities, is a trustee of the U.S. Conference of Mayors, is a member of the visiting committee to Harvard's John F. Kennedy School of Government, and holds honorary degrees from Harvard (the only Mayor of Boston ever to receive one), Boston University, Northeastern, and Tufts.



John F. Collins, Mayor of Boston (right), and Howard W. Johnson, President of M.I.T., shared obvious enthusiasm for the announcement at their mid-summer press conference: When he retires from his present Job in January, the Mayor will become Visiting Professor of Urban Affairs at M.I.T. (Photo: Dan Murphy, Boston Herald.)

Francis Bitter, 1902-1967

Francis Bitter, one of the world's leading authorities on magnetism who had been a member of the M.I.T. Faculty for 33 years, died on July 26 at the age of 65. In 1939 in the M.I.T. Magnet Laboratory he had created what was then the highest continuous magnetic field ever achieved in a new type of electromagnet which is still known as the Bitter magnet; 25 years later, another Bitter magnet in the new National Magnet Laboratory achieved a record-breaking field of 250,000 gauss.

In a special statement, Howard W. Johnson, President of M.I.T., called Dr. Bitter "one of the most distinguished members of our Faculty." Though his major efforts were devoted to the study of magnetism, President Johnson said, "his intellectual and personal interests went far beyond this central concern."

Professor Bitter, the son of Karl Bitter, a distinguished sculptor, attended the University of Chicago and Columbia University, from which he held both B.S. and Ph.D. degrees. He worked at California Institute of Technology and the Westinghouse Research Laboratories and held a Guggenheim Fellowship at Cambridge University, England, before joining the Department of Metallurgy at M.I.T. in 1934.

Following his success with the first large Bitter magnet in 1939, Dr. Bitter was called to Washington for World War II service at the Naval Ordnance Laboratory; after the war he returned to M.I.T. as Professor of Physics for research in nuclear magnetism. In 1960 he joined the Department of Geology and Geophysics to pursue research on terrestrial magnetism and the earth's magnetic envelope of plaşma, and from then until its completion in 1963 Professor Bitter had a central role in the planning and design of the \$9 million National Magnet Laboratory on the M.I.T. campus.

Dr. Bitter was the author of many books and papers, including especially Magnets: the Education of a Physicist, a book of personal memoirs in the Physical Science Study Committee series sponsored by Educational Services, Inc.

Thomas D. Brophy, 1893-1967

Thomas D'Arcy Brophy, '16, a Life Member of the M.I.T. Corporation and one of the leading members of his Class, was killed in a tragic automobile accident in Pawling, N.Y., on July 29. He was 73 years old.

Mr. Brophy was a distinguished figure in the American advertising industry. He was President of Kenyon and Eckhardt, Inc., of New York from 1937 to 1949 and Chairman of the Board from then until his retirement in 1957, and during that period the agency grew to become the sixth largest in the U.S. He was a leading advocate of the public responsibilities of advertising, and he helped conceive and found the Advertising Council.

Mr. Brophy became a Term Member of the M.I.T. Corporation in 1948 and a Life Member in 1953; he had served on several Visiting Committees, and he held the M.I.T. Club of New York's Silver Stein Award (1958) in recognition of his distinguished service to the Institute.

In a special statement, James R. Killian, Jr., '26, Chairman of the Corporation, noted that M.I.T. had long been one of Mr. Brophy's foremost interests. "He contributed generously and imaginatively to the work of the Corporation and to the activities of the Class of 1916," Dr. Killian said, "and he served the Institute with special distinction for many years as an adviser on public relations."

James H. Means, 1885-1967

Though he was officially a member of the M.I.T. community for only six years, the death of Dr. James H. Means, '06, on September 3 brought sorrow to many friends and admirers.

Dr. Means was a member of the M.I.T. Medical Department from 1951 to 1957, following his retirement as Jackson Professor of Clinical Medicine at Harvard Medical School and Chief of Medical Services for Massachusetts General Hospital. He was Acting Director of the Medical Department for 1954-1955.

But Dr. Means's professional association with M.I.T. began far earlier, when in 1937 he collaborated with Robley D. Evans, Professor of Physics, on the first investigation on the use of radioactive iodine for diagnosis and treatment of thyroid disease. Their success led to the building of the cyclotron at M.I.T. to prepare the needed isotopes.

Walter C. Schumb, 1892-1967

Nearly 50 years of association with M.I.T. ended during the summer for Walter C. Schumb, Professor of Inorganic Chemistry, Emeritus, who died on June 15 at the age of 75.

Professor Schumb joined the Institute in 1920 as Assistant Professor of Chemistry, having completed his education at Harvard and Magdalen College, Oxford; by 1934, when the American Chemical Society described him as one of the "ablest chemists and chemical engineers working in the U.S.," he was Professor and Director of the Research Laboratory of Inorganic Chemistry. He retired in 1958. Professor Schumb's research and teaching centered on silicon and fluorine compounds. He was a member of the American Academy of Arts and Sciences, Phi Beta Kappa, the Society of the Sigma Xi, and Alpha Chi Sigma.

Theodore H. Taft, 1880-1967

Theodore H. Taft, '01, who taught at M.I.T. for 48 years following his graduation in mechanical engineering, died in Peter-

borough, N.H., on August 12. He had been a recognized authority in power plant engineering and thermo-dynamics and was the author of widely used textbooks.

Professor Taft had made his home in Jaffrey, N.H., following his retirement from Institute duties in 1950. He served as an assistant in the Department of Mechanical Engineering beginning in 1902, became Instructor in 1905, and Assistant Professor in 1910, and was appointed Associate Professor of Heat Engineering in 1920; following retirement in 1945 he continued as lecturer until 1950. In addition to his Institute duties, Professor Taft for many years taught evening classes at the Lowell Institute School.

A LINAC for Middleton

M.I.T. has begun construction of a new 400-million-electron-volt linear accelerator in Middleton, Mass., under a contract from the U.S. Atomic Energy Commission.

The total cost of the project, including land, is estimated at \$5.6 million. Of this total, M.I.T. will provide over \$100,000 for site acquisition and \$880,000 toward the cost of the accelerator itself, and the balance will be met with A.E.C. funds.

Though modest in power compared with such machines as the 6-billion-volt Cambridge Electron Accelerator, the new machine now under construction will be distinguished by high beam intensity and long duty cycle. It will thus be useful for detailed studies of longer-term interactions between the beam and target nuclei than are possible with present accelerators.

The accelerator proper will be a specially designed copper tube 600 feet long fed at intervals with bursts of radio-frequency power from high-power transmitters. It will be contained in an underground vault some 10 feet high and 10 feet wide. A beam switchyard at the end of the 600foot-long linear accelerator will be used to send beams to several experimental areas. Laboratory and office space for the scientists and engineers and technicians using and operating the facility will also be provided. Portions of the complex will be underground and some of the experimental areas will be covered with concrete.

The beam will be used in two modes for nuclear structures studies. The primary electron beam itself will be used with target materials in many experiments; in other cases, the beam will be used to produce secondary beams of positrons, gamma rays, neutrons or mesons, which in their turn will be used to study target nuclei.

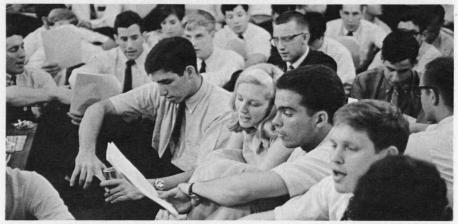
The new LINAC is due to be operational by mid-1969, and plans call for its extensive use by scientists from throughout Greater Boston. Its construction and operation are the responsibility of the M.I.T. Laboratory for Nuclear Science, of which Peter T. Demos, Ph.D. '51, is Director.











Two formulas dominate Rush Week: it is a time for the fraternities to put their best foot forward, to clean their houses and entertain graciously, and to seek among the freshmen those qualities which will produce a "fit" with the qualities each house holds for itself; and it is a time for freshmen to penetrate the "party" atmosphere seeking the true personality of each house, to size up themselves against the fraternities and fraternities, in turn, against their images of college life. Even though this complex equation is accomplished in the first three days in Cambridge, the result is almost always a successful—indeed, memorable—match.

Rush Week 1967

Even before the official orientation of Freshman Week-End began, over two-thirds of the new undergraduate men entering M.I.T. this fall had learned most of the campus gossip and had either made, or had made for them, one of the important decisions of their college careers during the four-day Rush Week sponsored by M.I.T.'s 28 fraternities. This year 676 freshmen (out of 864 men in the class) registered for Rush Week and 343 chose and were chosen to join one of the Institute's chapters.

The fraternities are an established way of life for about one-third of the male undergraduates. They form "a partnership in education with M.I.T.," Paul E. Gray, '54, Associate Dean of Student Affairs, told the meeting at which Rush Week officially opened, "an important extension of the Institute in the learning process."

Fraternities offer undergraduates a unique chance to accept responsibility for their living environment and for the character of their college life and friendships, he said. And they make possible a close relationship between freshmen and upperclassmen which is important for many students.

"As they function at M. I. T.," says Kenneth R. Wadleigh, '43, Dean of Student Affairs, "we feel our fraternities provide important diversity" in the housing program.

There are no significant differences between fraternities and Institute houses in terms of academic achievement and no basic ones in cost, Dean Gray told the Rush Week meeting. So the decision should depend on personal factors, he said—including "your personal view of the role of friends in your life"—whether you like to have relatively few but close friends or whether you want broad acquaintanceships.

The process of making the decision is a complex, intensive one. Elaborate rules promulgated by the Interfraternity Conference are designed to assure each freshman a chance to see all the fraternities in which he is interested and a chance for the fraternities, in turn, to see all the students without monopolizing any one of them.

For the fraternities it is serious business. There is financial pressure to fill the house, since income depends upon the number of residents. But the fraternities also make a serious effort to pick those who will contribute most to the particular strengths of the chapter, insists Michael J. Ginzberg, '69, I.F.C. representative. A single fraternity's budget for its food and entertainment in this fourday period may exceed \$2,000, and each fraternity is likely to have visits from nearly 200 students, according to Mr. Ginzberg. Life gets so complicated that a computer system is used to keep track of who is being entertained when and by what fraternity at what time.

It's hard work for the freshmen, too, for they take the decision seriously. They find that there are differences between fraternities—their campus and ofi-campus political interests, their regional character, their athletic and social interests. The average freshman visits four to six houses during Rush Week, chosen on the basis of mid-summer interviews with fraternity members and printed literature prepared by each house. "A rational decision is possible," Dean Gray told the freshmen, "if you go at the task carefully, keep your eyes and ears open, and don't panic."

Everyone connected with fraternities agrees that they're "different" at M.I.T., and some of the local chapters' biggest problems are connected with disentangling themselves from the fraternities' "national image." In general, according to Dean Wadleigh, the fraternities are responding positively to pressure against discrimination on racial or religious grounds and against "hazing" of new pledges. A year ago the M.I.T. Academic Council and the Alumni Interfraternity Conference, an organization of "frater-nity alumni" formed to support fraternity organization at the Institute, approved a statement of principles: "The Institute's inherent philosophy and its public responsibility combine to make it impossible to condone discriminatory practices, including those which are imposed by the national constitutions of a few fraternities and those which may be practiced as a matter of local chapter policy." No fraternity can benefit from financial assistance from M.I.T. unless it subscribes to this statement.

Freshmen at this year's Rush Week meeting were told by Tom L. Neal, '68, President of the Interfraternity Conference, that a few M.I.T. fraternities still are influenced by "traditions or national policies" on both hazing and discrimination. "But if you ask a fraternity," he said, "the house will give you a straight answer, and you can make up your own mind."

Of the 676 freshmen who came to Rush Week this year, the best guesses are that about half were seriously anxious to join a fraternity; the rest were "just looking." In fact, just over half finally received and accepted "bids." No one is sure whether any students who desperately wanted to join a fraternity came out of Rush Week without an invitation.

This year, for the first time, the Institute houses had a modest "orientation" of their own, so that students who were uncertain about fraternity life could inspect the dormitories and visit with residents before they made up their minds. But dissatisfactions remained. When so many freshmen come to Rush Week, it takes on many of the characteristics of the official orientation of Freshman Week-End, and both the dormitories and student government are uneasy about leaving such an important assignment to the fraternities. The Tech even suggests that Rush Week become an official M.I.T. event.

1,834 New Shoes

During the confusion of Rushing and Freshman Week-End, someone asked Paul E. Gray, '54, Associate Dean of Student Affairs, how to tell the new freshmen from everyone else. His answer: "The freshmen are all wearing new shoes."

If he was right, there were 917 new pairs of shoes (no bare feet) on the campus in September, with shining faces to match. As usual in each of the last 10 years, Roland B. Greeley, Director of Admissions, could say it was the "brightest, best prepared freshman class we have ever had." Their scores in College Board mathematical aptitude rank the class at or near the top among those entering any U. S. college this fall, and they are just as good in verbal aptitude. Professor Greeley's statistics also include:

- 1. Nearly 85 per cent of the freshmen ranked in the top 19 per cent of their high school classes.
- 2. Nine freshmen qualified for admission after only three years of high school.
- 3. Over 300 earned varsity letters in high school athletics.
- Nearly 350 held editorial staff positions on high school publications.

Among the class are two outstanding musicians: Ann Eve Kivisild of Willowdale, Ontario, who has studied and performed at the Toronto Conservatory of Music and holds medals for performances at the Canadian National Exhibition, and Bruce W. Cichowlas, who held scholarships at the Cincinnati Conservatory of Music and who was Ohio's Composer of the Year at the age of eight.

Howard W. Johnson, President of M.I.T., told the class during Freshman Week-End that "your goal, and our goal for you—is to live up to your potential.

"You face a world which looks both forbidding and exciting," he said, "where change is commonplace, where the thirst for new ideas has never been greater, and where, more and more, the responsibilities of major decisions are being placed in younger hands." He urged them to exercise "that rare privilege of the freshman to experiment."

During five days of Freshman Week-End orientation the new class met with their counselors, took placement tests in physics and mathematics, toured the campus and Boston, and listened to discussion groups on topics ranging from the value of modern mathematics research to the historic and cultural heritage of Boston.

At one such discussion group, Charles E. Holt, 3d, Ph.D. '62, speaking on "You vs. the Establishment," described eight allegorical students who might show up at M. I. T. Their names ranged from Letharge and Rigor to Blamor. "For some of them," he said, "rebellion today is a way of life. But most of us find society livable despite our reservations about aspects of it."



New scientist-astronauts: Philip K. Chapman, Sc.D.,'67, Anthony W. England, '64, and William B. Lenoir, '62.

Three Space-bound Scientists

In mid-September, three M.I.T. Faculty members plunged into the first phase of N.A.S.A.'s rigorous training program for scientist-astronauts, Philip K. Chapman, Sc.D. '67, Staff Physicist at the Experimental Astronomy Laboratory, Anthony W. England, '64, a graduate student in the Department of Geology and Geophysics, and William B. Lenoir, '61, Assistant Professor of Electrical Engineering, were among 11 scientists selected by N.A.S.A. this summer. They have now severed their direct connections with M.I.T. to work full-time for N.A.S.A., although they will continue to keep up informal links as part of the scientific side of their new tasks.

All three believe that their research interests and N.A.S.A.'s space programs fit together well. Mr. England is completing a doctoral thesis on solid materials under high temperature and pressure, a project which should give geophysicists the equations necessary to determine the materials and conditions in the earth's or moon's interior from seismic data. Mr. England-the youngest member of the astronaut squad-is also helping Professors Frank Press, M. Gene Simmons and David Strangway in the Department of Geology and Geophysics to design experiments to be conducted on the moon as part of the Apollo Applications Program. He may now have the opportunity to carry out these experiments himself.

Dr. Lenoir has also played a part in designing experiments for the Apollo Applications Program, having been principal investigator in a Research Laboratory of Electronics project to measure the earth's atmospheric temperature from oxygen microwave emission. He is also interested in furthering basic radio astronomy outside the restricting environment of the earth's atmosphere.

Dr. Chapman is one of two aliens among the team of 11. He was born in Melbourne, Australia, studied at the University of Sydney, and came to the U.S.A. to join the M.I.T. Experimental Astronomy Laboratory. He received his doctor of science degree from M.I.T. last June for a thesis concerning the theoretical foun-

dations of gravitational experiments in space; he hopes in his new career to develop methods of testing approaches to gravitation different from Einstein's General Theory of Relativity.

M.I.T. is the only school with more than one faculty member in the latest squad of scientist-astronauts. The three rookies join four other alumni already active in the space program—Lt. Col. Edwin E. (Buzz) Aldrin (U.S.A.F.), '63, Lt. Col. David R. Scott (U.S.A.F.), '63, Russell L. Schweickart, '56, and Cmdr. Edgar D. Mitchell (U.S.N.), '64.

New Funding for Instant Braille

For the last six years, researchers at M.I.T. have been developing a high-speed Braille embosser with the hope of eventually making all published material availble to the blind in Braille (see Technology Review, Dec., 1966, p. 28). The program received new momentum this summer with a grant of \$268,000 by the John A. Hartford Foundation, Inc., of New York City, which will fund a three-year program to continue development and evaluation, prepare manufacturers' drawings and specifications and build 20 production models of the high-speed Brailler.

The system, combined with a conventional teletypewriter and linked by telephone to a computer, enables an ordinary typist with no knowledge of Braille to produce instant Grade 2 Braille, the form most widely used. The computer translates English from the typewriter into Braille signals to drive the Brailler, which in turn produces Braille at more than 190 English words a minute. Alternatively, the system can emboss Braille from the paper tapes used in printing houses to operate typecasting machines for conventional publishing.

As M.I.T. produces improved models, the developers plan to test them out in schools, including regular schools attended by blind children (44 per cent of the nation's 9,900 blind children now attend integrated blind-sighted schools). The field tests will start in selected schools this fall.

Medical Cooperation

Harvard University and M. I. T. are exploring a new collaboration in basic and applied research and education in the life and health sciences and in the delivery of medical care. In its story of the announcement, the Boston *Globe* said the result "could alter the course of medicine for decades."

It could "make the physical sciences an integral part of medicine, producing a new breed of 'life-engineer' who views the living person in engineering and mathematical terms," the *Globe's* Carl M. Cobb wrote.

Implementation of the program will in fact depend upon the deliberations of a new Joint Liaison Committee on Engineering and Living Systems appointed by Presidents Howard W. Johnson and Nathan M. Pusey. The Committee's task is to bring together the available resources of information and facilities in the physical and engineering sciences, mathematics, and biology and medicine.

President Johnson, in supporting the Committee's effort, has said that "we must find ways to place new emphasis and attention on the systematic nature of large-scale human uses of technology. I mean by this," he told the Committee, "that in this next period of history we must make special effort to meet in a systematic way the massive needs of our society. This human focus of technology should be a primary concern for today and for the future."

Among specific areas of co-operation envisioned for the new program are: *Medical care*: The application of systems analysis, operations research and new management theory will enable hospital and public health administrators to use the resources at their disposal more effectively. This part of the committee's program will have obvious local applications.

New technology: The program will apply new technology to the improvement of medical care. Computer control of such tasks as laboratory testing and drug administration, and the assistance of automation in diagnosis of disease are examples of the potential of today's technology. Artificial organs: Work is underway at Harvard and M.I.T. on many machines immediately concerned with the life or health of patients—for example, artificial kidneys, feed-back mechanisms to control and maintain blood pressure automatically, and sensory aids to help the blind to read.

Education: An educational program will enable undergraduates, graduates and post-doctoral researchers to gain qualifications in both the medical and engineering sciences, or at least to become qualified in one field and obtain a working knowledge of the other. Basic research: Closer links between the biological and physical sciences will result from basic studies into the integration of these two fields of scholarship and application.

Individuals Noteworthy

The University of Chicago has awarded honorary degrees to Noam A. Chomsky, Ward Professor of Modern Languages and Linguistics at M.I.T.; Salvador E. Luria, M.I.T. Sedgwick Professor of Biology; Murray Gell-Mann, Ph.D. '51, Professor of Physics at the California Institute of Technology; Franco Modigliani, M.I.T. Professor of Economics and of Finance; and Robert M. Solow, M.I.T. Professor of Economics.

Robert M. Campbell, who conducted graduate work at M.I.T. during the summers of 1938 and 1940, received the National Institute of Ceramic Engineers' Greaves-Walker Award for 1967. Milton U. Clauser, Director of Lincoln Laboratory and Professor of Aeronautics and Astronautics at M.I.T., was awarded an honorary doctor of engineering degree by Purdue University, where Dr. Clauser was formerly head of the School of Astronautics. Roman Jakobson, Institute Professor at M.I.T., is now Harvard's Samuel Hazzard Cross Professor of Slavic Languages and Literature.

Charles G. Overberger is the new chairman of the Department of Chemistry at the University of Michigan. Frank Press, Head of the M.I.T. Department of Geology and Geophysics, is a member of the board advising N.A.S.A. on the scientific aspects of manned and unmanned missions to explore the moon and planets.

The American Society for Testing and Materials has given its Award of Merit to Samuel A. Greeley, '06, partner in Greeley and Hansen, Chicago, for "contributions of leadership, integrity, and uncompromising adherence to quality" in his A.S.T.M. assignments drawing upon 50 years of "distinguished international experience in the fields of water supply and sanitary engineering." Philip Walker, '07, has been made an honorary trustee of Barrington College, following 32 years of "outstanding contribution" to the school. Arthur C. Hardy, '18, M.I.T. Professor of Optics and Photography, Emeritus, received an honorary doctor of laws degree from the University of California at Berkeley.

Arne Lier, '23, Chief Structural Engineer for the Port of New York Authority, received the 1967 award as "Metropolitan Civil Engineer of the year" from the American Society of Civil Engineers.

Charles A. Thomas, S. M. '24, Chairman of the Finance Committee of Monsanto Company, was awarded an honorary doctor of science degree by Simpson College.

Robert W. Blake, '41, has been named Chief of the Building Systems Section of the NBS Building Research Division, Institute for Applied Technology. James A. Creighton, '41, is now Assistant General Manager of the Burns Harbor plant of Bethlehem Steel Corporation. Gardner M. Ketchum, '41, is now Head of the Department of Mechanical Engineering at Union College. Howard O. McMahon, Ph.D. '41, President of Arthur D. Little,

Inc., is Chairman of the Board of 500 Incorporated, a new subsidiary of ADL; Allen Latham, Jr., '30, is President.

Courtland D. Perkins, S.M. '41, has been elected to the Board of the MITRE Corporation. Donald D. Scarff, '41, formerly General Manager of the General Electric Company's Lamp Division at Nela Park, Cleveland, Ohio, is now General Manager of the Company's Consumer Electronics Division at Syracuse, N.Y.

John D. Briggs, '42, formerly Manager of Market Research and Planning, is now Vice President for Planning and Assistant to the President of Bethlehem Steel Corporation. Carl R. Meurk, '42, is now General Manager of the Seattle Division of Todd Shipyards Corporation.

Leo J. Feuer, '43, is now Executive Vice President of the William Carter Company. Frank M. Staszesky, '43, is Executive Vice President of the Boston Edison Company. Palmer P. Derby, '44, is now a Vice President of the Raytheon Company; he serves as Assistant General Manager of the Company's Microwave and Power Tube Division. Nicholas J. Grant, Sc.D. '44, Professor of Metallurgy at M.I.T., is now a Director of the Loomis-Sayles Mutual Fund. Harold S. Mickley, Sc.D. '46, Director of the M.I.T. Center for Advanced Engineering Study, has been elected to the Board of Directors of Stauffer Chemical Company.

Carol E. Belton, '50, is now Technical Assistant to the President of Union Carbide. Milton Stern, '50, is now Director of Technology in the Materials Systems Division of Union Carbide Corporation.

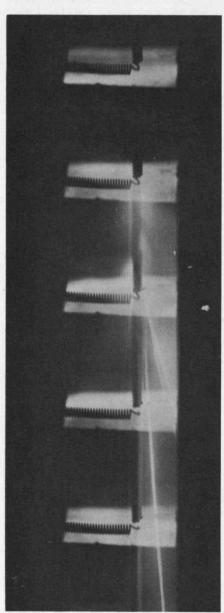
John H. Gerstenmaier, S. M. '52, who has been President of Motor Wheel Corporation for three years, is now Director of all domestic manufacturing for the parent Goodyear Tire and Rubber Company. Captain James C. Matheson, S. M. '52, is now Director of the Naval Research Laboratory. William D. McKinley, '52, is now Manager of Raytheon Company's Wayland Laboratories. Philip H. Smith, M.T.E. '52, is now Senior Vice President of Copperweld Steel Company.

Colonel Geoffrey Cheadle, E. E. '63, is now Director of Information for the Air Force Systems Command, Andrews AFB, Md. Lieutenant Commander Henry Cox, Sc. D. '63, holds the 1966 David W. Taylor Award for Scientific Achievement at the Naval Ship Research and Development Center in Carderock, Md. Laurence B. Gardner, '63, received the Henry Ashbury Christian Prize of the Harvard Medical School "for diligence and notable scholarship." Joseph S. Perkell, '62, received the Dr. Grace Milliken Award of the Harvard School of Dental Medicine for the outstanding paper in the field of dental health.

Joseph Fernandez, S. M. '66, has been appointed chief of the Management Support Division of N.A.S.A.'s Electronics Research Center in Cambridge.

Strobe Probe

Harold E. Edgerton, Sc.D.'31



Mystery Photograph

The picture above is a continuously moving-film camera photograph of a tungsten filament as it melts, made in the M.I.T. Stroboscopic Laboratory. The white-hot particles of molten tungsten have sufficient light to leave a streak on the film.

A small xenon lamp directly behind the tungsten filament shows a shadow of the filament. It also shows a shadow of the white particle, even if the light from the particle has exposed the film. Why?

Puzzle Review

Hello again. I should like to greet any oldtimers who are back for another year of frustration. Of course new readers with fresh ideas (and fresh problems) are also welcome; I'll explain the ground rules to them.

All correspondence should be addressed to:

Allan Gottlieb Department of Mathematics Brandeis University Waltham, Massachusetts 02154

Yes, Virginia, that's Brandeis. My official academic connection with M.I.T. ended in June when I received my bachelor's in mathematics. I am now in the *green* land of Waltham admiring the *trees* and working towards a Ph.D.

O.K., let's get to the problems.

Problems

1 The following letter was sent in by John H. Boynton, '58:

Dear Allan,

Your column does as it is intended—provides relaxation while provoking logical thought. Most of my math, as I am sure is the case with other seasoned alumni, is too far behind me to solve the bulk of your interesting problems. The graphical and trial-and-error puzzles, however, have given me much enjoyment. Keep up the good column.

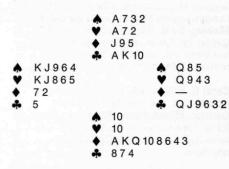
I would like to propose a problem: Given the number N, composed of 10 integers, find the number N', where the first integer is the number of zeros in N, the second integer is the number of ones in N, and so forth up to nine, such that N=N'. This puzzle can obviously be solved by trial and error, which is the way I did it, but you might ask your readers to develop an analytical technique, if one exists. The answer I got is 6,210,001,000. I cannot testify to the uniqueness of the answer, since I stopped when I found one solution,

and without an analytical representation, I cannot prove it.

2 F. Wade Greer, Jr., '52, proposed the second problem for this issue.

How about the one about the flat triangular field, 100 feet per side having 60-, 80-, and 100-foot-high flag poles at the respective corners. The problem is to determine the length and base location for a step ladder that can be rotated and just touch the top of each flag pole.

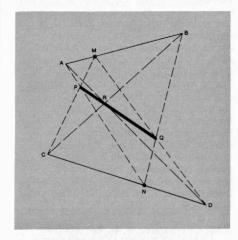
3 One of my friends, Fred Ciaramaglia, '69, has supplied the following bridge problem:



Contract: seven diamonds by South; opening lead: club five.

4 John L. Joseph, '40, a "Puzzle Review" regular, sends in the following challenge:

Given any two segments AB and CD and M is any point on AB and N is any point on CD, show that intersection P of MC with AN and intersection Q of MD and NB and R, the intersection of AD and BC are colinear.



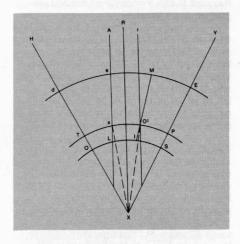
5 The last regular problem is proposed by an army captain, Roger A. Whitman, '61: Express the volume of a regular dodecahedron in terms of the length of an edge.

(O.K., new math types, let's go-Ed.)

Speed Department

(These problems are less rigorous and answers are not printed—Ed.)

SD1 What's wrong with Harry Dee's ('67) solution to the impossible problem of trisecting an angle with straight edge and compass?



Bisect the given angle HXY with RX. Draw parallels AL and rO¹ at equal distances to RX. With X as center, swing arcs OS and dE. Bisect arc LS at I, and arc eE at M. Describe arc TP through O¹, where MI cuts the parallel. The angle is trisected at x and O¹, because MI is the locus of the midpoints of all the arcs drawn with X as center and contained between AL and XY. QEF and QED.

SD2 Sanford S. Miller, '60, wants to know what is the next term in the sequence O,T,T,F,F,S,S,E, .

Solutions

78 Given: 11 balls of same weight plus one heavier or lighter (12 total). Identify the odd ball and determine whether it is heavier or lighter with three weighings on a two-pan balance. To make it more difficult, what is the maximum number of balls from which the odd one can be identified with four weighings? with five weighings? with n weighings?

The "neatest" solution to the problem was submitted by Doug Hoylman, '64, who typed his response.

Letter the balls ABCDEFGHIJKL. For the first weighing, balance ABCD against EFGH.

- I If it balances: The "bad" ball is one of IJKL. For the second weighing, match IJ against KA.
- 1. If this balances, L is the bad ball, and it may be matched against any "good" ball for the third weighing, to determine if it is heavy or light.
- 2. If IJ is heavier, then either I is heavy, J is heavy, or K is light. Match IK against any two good balls for the third weighing. If IK is heavier, I is heavy; if IK is lighter, K is light; if it balances, J is heavy.
- 3. If IJ is lighter, interchange "heavy" and "light" throughout 2.
- II If the first weighing does not balance: Without loss of generality we may assume ABCD is heavier. Then either one of ABCD is heavy, or one of EFGH is light. For the second weighing, match ABE against CDF.
- 1. If this balances, then either G or H is light, and they may be matched against each other for the third weighing.
 2. If ABE is heavier, then either A is heavy, B is heavy, or F is light. For the third weighing, match AF against any two good balls. If AF is heavier, A is heavy; if AF is lighter, F is light; if it balances, B is heavy.
 3. If CDF is heavier, replace A by C, B by D, and F by E in the above instructions.

For the more general question of how many balls can be thus judged by n weighings, let m be the maximum such number. Then for m balls, there are 2m possible situations. For each weighing there are three possible outcomes (left side heavy, right side heavy, balance), hence for n weighings there are 3" possible outcomes, and these must distinguish between the 2m situations, so we must have $2m \le 3^{\circ}$, or $m \le 3^n/2$, or, since 3^n is odd and m is an integer, $m \leq (3^n - 1)/2$. This gives an upper bound for m, but this need not be attained for any particular n. In particular, for n = 3 this formula gives $m \le 13$, while we actually have m = 12.

Also solved by John Joseph, Sanford Miller, and Shih-Ping Wang, '61, who included two similar problems which will appear next time.

79 Five island natives spend all day gathering coconuts. They finish the job when it is dark and decide to leave the coconuts in a pile and come back in the morning to divide them up. At midnight one native wakes up and decides he wants his 1/5 now. He goes to the pile, divides it into five equal piles, and finds that there is one coconut left over. He gives it to a monkey. The native takes away one of the five piles, leaving the other four piles there. He pushes the four piles into one big pile as he leaves. At 1 a.m. native #2 wakes up and decides he wants his 1/5. He goes to the pile, divides it into

five equal piles, finds one coconut left over, gives it to the monkey, takes away one pile, and leaves the rest. At 2 a.m. native #3 does the same thing: divides the total into five equal piles, gives one nut left over to the monkey, takes away one pile. At 3 a.m. native #4 does the same thing. At 4 a.m. native #5 does the same thing. After native #5 takes his coconuts away, the quantity of nuts left is evenly divisible by five. How many coconuts were gathered by the natives?

John Joseph sent in the following solution:

left	taken nati	ve
n	(n-1)/5	1
(4n - 4)/5	(4n - 9)/25	2
(16n - 36)/25	(16n — 61)/125	3
(64n - 244)/125	(64n - 369)/625	4
(256n — 1476)/625	(256n — 2101)/3125	5

(1024n - 8404)/3125 = 5p (p is an integer) (15625p + 8404)/1024 = n.

p must be divisible by 4. Let 4r = p. (15625r + 2101)/256 = n 61(9/256r) + 8(53/256) = n (9r + 53)/256 = n - 8 - 61r = s 9r = 256s - 53.

By the sum of digits, 4s-8 must be divisible by 9.

 $n = 11 + 8 + (61 \times 307) = 18,746.$

Also solved by Eric Rosenthal, son of Meyer S. Rosenthal, '47, Paul J. Schweitzer, '61, Jon Livingston, John E. Prussing, '62, Warren J. Himmelberger, '47, Vernon J. Wyatt, Doug Hoylman, and F. Wade Greer, Jr., who adds "John A. Maynard, '46, is a stinker! Had a lousy weekend!"

81 All four hands may be viewed in this bridge problem:

```
    ★ 5
    ★ 85
    ★ AK7
    ♣ AK86432
    ★ (107)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    ★ (2762)
    <l
```

Bid 7 hearts by South. Lead queen of clubs. Problem: make bid against *any* defense (after the club lead).

This problem caused a great deal of interest. Several people wrote to me over the summer asking for a solution. Since there would have been a several month delay until the answer appeared, I complied with their requests. This will not be a general practice. The solution I sent to them was by Peter J. Davis, Jr., son of Peter J. Davis, '48, and is as follows:

A double finesse could drop East's queen of hearts - but only at the expense of losing a spade trick to West. So a spade trick must be promoted while East's holding is pared down until he is forced to ruff a lead from the board, giving South his final trump finesse. West's club lead is taken on the board, and South sluffs a diamond. A heart is led from the board: East can't help but play low, and South finesses the 10. The ace of spades is cashed, and the jack of spades is led toward the board. If West plays high, the declarer ruffs; if low, a low club is sluffed and another spade is led. West's king of spades drops. South ruffs on the board, and a low club is returned. If East ruffs, South overruffs, draws trump and has no problem cashing his winners to make the contract. If East sluffs-probably a spade-South ruffs, leads a diamond to the board and ruffs another club. The last diamond is led to the ace on the board, and the ace of clubs is led. If East ruffs. South overruffs, draws trump, and he holds a good spade trick. If East sluffs, South sluffs his spade and any card may be led from the board; East has to play a trump, and South gets his final finesse. South's remaining trumps are good.

Another elegant solution was submitted by James Kaltenbronn, Ph.D. '60.

82 The unit disk E^2 is defined as the set of all points (x, y) such that $x^2 + y^2 < 1$ (x and y are real numbers). Prove the Brouwer fixed point theorem which asserts that every continuous function f from E^2 to E^2 has a fixed point, i.e., there is an x in E^2 such that f(x) = x.

Doug Hoylman found a typographical error in the statement of the problem. He states:

I hope none of your readers worked too hard on this one, because as stated (for the open disk) it's false. For a counterexample, superimpose on the plane a polar co-ordinate system with origin at -1, 0), and consider the function $(r, 0) \rightarrow$ (r/2, 0). Clearly this is continuous, but it has no fixed point, since r = 0 is now in the open disk. The Brouwer fixed point theorem is stated for the closed disk, $x^2 + y^2 \le 1$ (and can be generalized to any convex compact subset of the Banach space). I don't know how to prove it. For a quick problem, your readers might try to prove the corresponding result in one dimension, i.e., any continuous function from (-1, 1) to itself has a fixed point.

(For a proof of the Brouwer fixed point theorem, see Homology Theory by P.J. Hilton and S. Wylie. — Ed.)

Correspondence Review

"Safety Hoax"

To the Editor:

A few words inspired by your June issue account (p. 33) of the hilarious talks about "The Conscience of the Engineer" by that Harvard lawyer who said he visited M.I.T. once. (Do I correctly assume that your authoritarian publisher has failed to provide an atmosphere which would permit you to exercise your editorial conscience and comment on the talk?)

Reading his Unsafe at Any Speed and Safety Last last year, my conscience was so offended that I wrote a 6000-word expose entitled "The Great Highway Safety Hoax." Recently sold to a publisher as research material for a writer more prominent than I, it has not yet appeared in print. Pending that event, it is difficult to refrain from brief comments on a couple of Nader's "points."

Re the "authoritarianism of the stylist over the engineer" barb: while it is true that the auto industry is no less authoritarian than any other healthy dictatorship, the power lies welded to the presidents and division managers. Any superficial survey of the industry would quickly reveal that none of this authority is delegated to stylists, engineers, accountants, lawyers, or any other hired help. The staff's function is advice, not decision making. So much for that quackery.

Which brings us to that tear jerker par excellence: "anonymous letters from conscience-stricken engineers" who knew of faults but were afraid to publicize them! Picture the trembling, furtive engineers, diploma on wall, curtains drawn, nervously scratching an anonymous note, not to Dear Abby, but to Dear Ralphie: "My friends used to tell me that I had a nice, well-developed conscience, but now it is badly stricken. I decided that the company I was working for had faults. When I told them to mend their evil ways (I don't think they have even a teeny conscience), they said 'Knock it off.' That 'stricked' my conscience real bad, Ralphie. Could you tell us engineers with delicate, sensitive consciences what company executives we can work for who will do anything we tell them to do?"

To return to reality, I personally know an automotive corporate Vice President of Engineering who persuaded his management to overrule a styling-proposed (!) body structure because he claimed it was "unsafe." The next year the other major corporation offered the same type.

of body structure—and it sold like hot cakes! Now, what do you think influenced the corporate plans for the next model year, the bold Vice President of Engineering with his pink, unstricken conscience, or the sales figures?

Seriously, anyone who thinks engineers should play a more important role in shaping events should demand courses to develop their ability to convince people (salesmanship) and not worry about developing their consciences.

Lewis B. Simon, '35 Oxnard, Calif.

Whatever the Review's problems, they do not include an authoritarian publisher. We felt sure that Technology Review's readers could come to their own conclusions about Mr. Nader's comments without our help, and Mr. Simon's letter fully justifies that expectation.—Ed.

Poetry for Technology Review

To the Editor:

How can you hold your head up after publishing Robert C. Cowen's rather good comments on Harold Goodwin's call for sea poets (see Technology Review, June, 1967, page 5)? I have looked through recent issues of the Review and found no poetry, so here to repair the omission is a short verse which I call "The Copenhagen Interpretation," inspired by Ruth Nanda Anshen's writing: "... Niels Bohr has sought to unite the quantum and the wave, both of which constitute the very fabric of life's radiant energy."

Now I thirst and remember father answering Job out of the whirlwind: The waters are hid as with a stone.

This quantum game of dice is now forsaken by the entailing water Crumbling in denial and dissolving when steeped.

If they roll away the stone on the first day, the day after tomorrow,
The waves of the sea may dilute the vinegar.

C. E. Bice University, Ala.

"Selenar and Thalassar"

To the Editor: Some of us oldsters have poor eyesight even with magnifying lenses. Why not have Class Notes from 1912 and earlier in large type? Again for the benefit of us ancients, have ads such as "Willsea Works of Rochester" have an explanatory note saying what they manufacture are "selenar and thalassar mechanisms," potato mashers or IBM devices. "Turric, alphanumeric" doesn't help if I should need one in my kitchen.

George R. Wadleigh, '97 Hastings-on-Hudson, N.Y.

Alumni Giving

To the Editor:

In the July issue, on page 55 in a third of a column you make passing reference to alumni gifts of better than 5½ million dollars.

Speaking for the Class of 1927 and knowing how hard Harold Fisher and his committee worked, I, for one, react most adversely to this cavalier treatment of alumni giving. One might assume that this money is nice for the Institute to have but not of too much basic importance.

I feel that the Institute, through the agency of the *Review*, as well as other means, has a constant selling job to do in this regard. Handling this matter as it was done in the July issue is hardly the way to go.

C. P. Whittier, '27 Manager, Customer Packaging Services Owens-Illinois

Final figures for alumni giving for 1966-1967 are on page 68 of this issue—with, we hope, more emphasis and aplomb. —Ed.

Impression Corrected

To the Editor:

Technology Review's July cover—a picture of Alphonsus on which is superposed a radar grid—may convey the wrong impression to some readers, namely, that Alphonsus is a radar-bright crater. To my knowledge this is not the case. I presume the grid idea came from the Lincoln Laboratory image and was added to the photo more as artistic decoration, with some general relation to the discussion in the text, than as showing a specific radar object. But you may receive a query or complaint from some radar astronomer on this matter.

John C. Noyes Boeing Scientific Research Laboratories building construction alterations

H. H. HAWKINS AND SONS COMPANY 175 California St. Newton, Mass. 02158

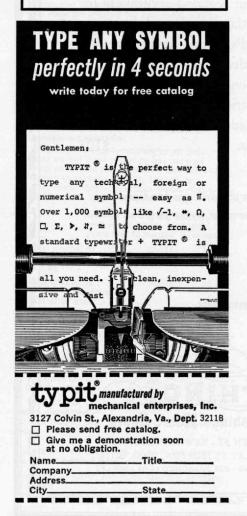
STEVE HAWKINS '57



Reduced Travel Rates

For M.I.T. Alumni
Tours to the Orient,
India, South America
For details write:

Technology Review Room E19-430 Massachusetts Institute of Technology Cambridge, Massachusetts 02139



THOMAS E. SEARS INCORPORATED INSURANCE Special and skillful handling of unusual insurance and reinsurance problems Thomas E. Sears (1882-1958) '03 Thomas E. Sears, Jr. '32 Richard W. Sears Hugh L. Walker '24 BOSTON Park Square Building 31 St. James Avenue Telephone HA 6-8300

Index to Advertisers: October/Novem 1967	ber,			
Aerofin Corporation	62			
Albert Pipe Supply Company	46			
Alumni Flights Abroad 77	, 44			
American Airlines, Inc.	5			
American Smelting & Refining				
Company	er II			
W. J. Barney Corporation	16			
Barnstead Still & Sterilizer	46			
Bell Telephone Laboratories	7			
Boston Manufacturers Mutual				
	and			
Machinery Insurance Company	47			
Brooks Brothers	78			
Connecticut Mutual Life Insurance				
Company	18			
Diefendorf Gear Corporation	62			
Paul E. Dutelle & Company, Inc.	44			
Eastman Kodak Company	15			
Farmer Electric Products				
Company	46			
First National Bank of Boston/				
Old Colony Trust	1			
General Motors Corporation	80			
General Radio Company Cover				
H. H. Hawkins & Sons Company	77			
Harvey Hubbell, Inc.	60			
ITT Federal Laboratories	63			
The Kerite Company	19			
Kulite Tungsten Company	16			
Alexander Kusko, Inc.	44			
Lockheed Missiles &				
Space Company	59			
Lockwood Greene Engineers, Inc.	44			
Lord Electric Company	60			
Charles T. Main, Inc.	62			
Manufacturers Mutual Fire				
Insurance Company	61			
Edward R. Marden Corporation	44			
Massa Division of Dynamics				
Corporation of America	4			
Massachusetts Mutual Life Insurance Company	6			
Mechanical Enterprises	77			
New England Mutual Life				
Insurance Company	14			
Norcross Corporation	60			
PR-New York, Inc.	62			
Thomas E. Sears, Inc.	77			
Silent Hoist & Crane Company	16			
Stevens-Arnold, Inc.	46			
Swindell-Dressler Company,	70			
Division of Pullman Inc.	44			
Syska & Hennessy, Inc.	44			
The Tech Coop Cover	Ш			
United States Trust Company	3710			
of New York	17			
Vappi & Company	79			
Wanless Electric Company	45			
Technology Review's monthly cir-	Part I			
culation is 32,000. For a rate card and				
further information write to Advertising				
Manager, Room E19-430, M.I.T., Cambridge, Mass. 02139				
Cambridge, Mass. 02103				



OUR BROOKS-TWEED SPORT JACKETS in rich Fall colorings and patterns

Brooks-tweed is woven in Scotland exclusively for us of a blend of soft Shetland wool—and the strong durable wool of Scotland's Black-Faced Sheep. We offer it in a handsome selection of patterns such as District checks, herringbones, stripes and diagonals, plus fancy mixtures in striking heather tones. The jackets themselves are made in our own workrooms, on our distinctive models. \$105

Brooks-Tweed is also available in handsome heavy duty outerwear, from \$90

ESTABLISHED 1818



Men's & Boys Purnishings, Hals & Shoes

346 MADISON AVE., COR. 44TH ST., NEW YORK, N.Y. 10017 46 NEWBURY, COR. BERKELEY ST., BOSTON, MASS. 02116 PITTSBURGH • ATLANTA • CHICAGO • SAN FRANCISCO • LOS ANGELES

CONTRACTOR CONTRACTOR

Statement of Ownership, Management and Circulation

(Act of October 23, 1962: Section 4369, Title 39, United States Code)

- Date of filing: September 7, 1967.
 Title of publication: Technology Review.
 Frequency of issue: Monthly from November July inclusive.
- 4. Location of known office of publication (street, 4. Location of known office of publication (strecity, county, state, zip code): 215 Canal Street, Manchester, Hillsboro, N H. 03105.

 5. Location of headquarters or general offices of the publishers (not printers): Room E19-430,
- Massachusetts Institute of Technology, Cambridge, Mass. 02139.
- 6. Names and addresses of Publisher, Editor, and Managing Editor:

Publisher: Donald P. Severance, Room E19-430, M. I. T., Cambridge, Mass. 02139

Editor: John I. Mattill, Room E19-430, M. I. T., Cambridge, Mass. 02139

Managing Editor: Peter Gwynne, Room E19-430, M. I. T., Cambridge, Mass. 02139

- 7. Owner (if owned by corporation, its name and address must be stated and also immediately thereunder the name and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address as well as that of each individual must be given): Alumni Association of the Massachusetts Institute of Technology, Room E19-430, M. I. T., Cambridge, Mass. 02139.
- 8. Known bondholders, mortgages, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities (if there are none, so state): None. 9. Paragraphs 7 and 8 include, in cases where 9. Paragraphs 7 and 8 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stock-holders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner. Names and addresses of individuals who are stockholders of a other than that of a bona fide owner. Names and addresses of individuals who are stockholders of a corporation which itself is a stockholder or holder of bonds, mortgages or other securities of the publishing corporation have been included in paragraphs 7 and 8 when the interests of such individuals are equivalent to 1 percent or more of the stock are considered. the total amount of the stock or securities of the publishing corporation.
- 10. This item must be completed for all publications except those which do not carry advertising other than the publisher's own and which are named in sections 132.231, 132.232, and 132.233, Postal Manual (Sections 4355a, 4355b, and 4356 of Title 39 United States Code):

	Average no. copies each issue during preceding 12 months		Single issue nearest to filing date	
A. Total number copies printed (r press run)		23,124	24,199	
B. Paid circulati 1. To term subso by mail or by ot means	cribers	19,960	22,790	
2. Sales through agents, news de or otherwise		57	81	
C. Free distribut (including sampl mail, carrier deli or by other mean	es) by very,	1,704	1,640	
D. Total number copies distribute (sum of lines B1)	d,	21,721	24,511	

I certify that the statements made by me above are correct and complete.

(Signature of editor, publisher, business manager, or owner)
John I. Mattill, Editor



BUILDERS AND CONTRACTORS

240 SIDNEY STREET CAMBRIDGE, MASS. 02139 876-7505

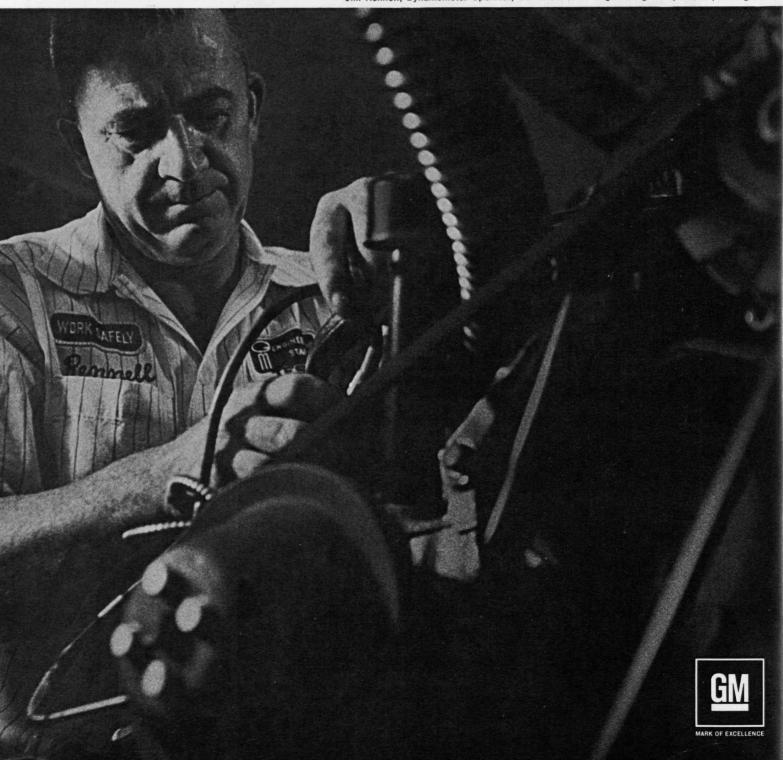
General Motors is people making better products for people.

Jim Rennell is murder on motors. For your protection.

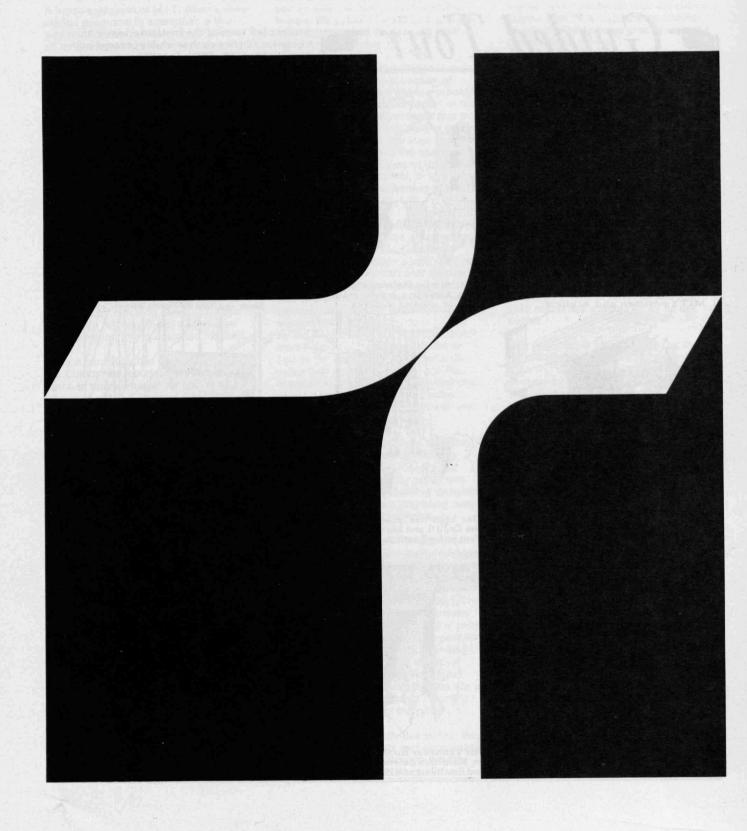
You would never dream of doing the things to your car that Jim Rennell does to his engines. Like running them wide open 29 hours straight on a dynamometer. Which is like driving your car up a mountain all day. Pulling a heavily loaded trailer.

It's only one of dozens of grueling tests skilled technicians, like Jim, throw at GM engines before they're approved for production. To make sure they'll take anything you can ever throw at them. It's another way we protect your investment in each Chevrolet, Pontiac, Oldsmobile, Buick or Cadillac car.

Jim Rennell, Dynamometer Operator, General Motors Engineering Staff, Warren, Michigan.



Alumni Review

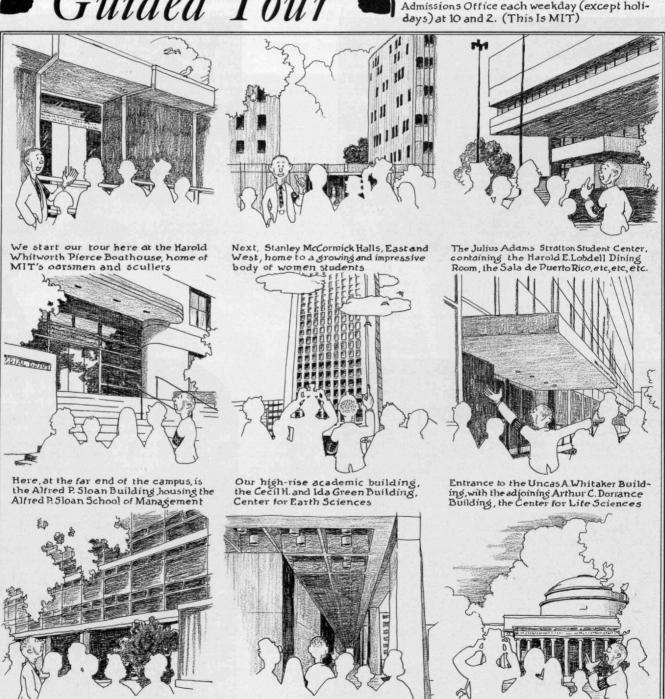


Kane on M.I.T.

-Guided Tour

Student-led tours of the Institute leave the Admissions Office each weekday (except holidays) at 10 and 2. (This Is MIT)

.... Building 10/



The Vannevar Bush Building, Center for Materials Science and Engineering, And now, Heart of MIT, Center for Everything.

The Karl Taylor Compton Building, Laboratory for Nuclear Science and, as of now, the Computation Center

Alumni Review

Alumni Association: Long Range Planning

A broad extension of M.I.T. Alumni Association programs to strengthen a two-way relationship between M.I.T. and all its graduates has been recommended by the Long-Range Planning Committee of the M.I.T. Alumni Association.

The two-year review of the Association's present programs and future opportunities, conducted under the direction of John A. Lunn, '17, General Chairman, and D. Reid Weedon, Jr., '41, Deputy Chairman of the central committee, represents "one of the most extensive self-studies ever made by an alumni organization in the U.S.," according to Donald P. Severance, '38, Executive Vice-President of the Association.

No revolutionary new forms of activity for the Alumni Association, the Institute, or individual alumni are included in the Committee's recommendations. The proposals, instead, emphasize the opportunity to strengthen and extend alumni programs by reaching those who have heretofore not responded to activities and communications designed for them.

"The Association has been deficient," the Committee reports, "in developing plans to make it easier for alumni to be a part of M.I.T. in ways other than contributing or soliciting funds."

Alumni participation should be possible in two ways: through working on the programs, and through taking advantage of the programs offered. In both cases, the Committee reemphasizes "the need for a variety of programs, activities and communications" to assure that something is available to interest each alumnus, and because no alumnus can be expected to take part in everything. "M.I.T.," the Committee stresses, "cannot hope to succeed in its purposes without the broadest social support.

"We should continue to nourish loyalty, warmth, and friendship," said the Committee. But substantive activities for alumni participation in M.I.T.'s affairs and progress should be especially encouraged "to overcome the widespread preconception that alumni activities exist solely for the purpose of raising money."

The Committee's principal recommendations, to be fulfilled within the next 10 years, fall into nine areas of activity by the Institute and the Alumni Asso-

ciation:

Establishment of programs in which M.I.T. and its alumni, working together, may make important contributions in the public interest through education, community service, and local industrial development.

Growing emphasis on activities in support of the continuing education of alumni. Education as a lifelong process was one of the "major concerns" of the Committee, and it recommends that a new committee be designated to aggressively explore the various ways in which M.I.T. may contribute to the continuing professional effectiveness of its graduates—and how the alumni, in turn, may contribute to the effectiveness of M.I.T. educational programs.

Extending Alumni Association activities to reach alumni who hold only graduate degrees from M.I.T. The Committee recommends that within a year graduate alumni should have their own departmental organizations "as the counterpart of the undergraduate class organizations," that special administrative support for these groups be provided by the Association, the separate departmental communications be added as fast as the individual departments develop their graduate groups, and that departments consider annual seminars, social gatherings, and other methods of first-person communication with their graduate alumni.

Improve the traditional class organizations for undergraduate alumni by spreading their organizational jobs, taking advantage of living group and activity affiliations, developing geographical representation, and improving communication among classmates.

Continuing support and enhancement of the Alumni Fund. The Institute hopes that its future financial needs can be secured "by a forceful, steady approach rather than by periodic capital drives, according to the Committee report. Thus the Alumni Fund, the principal means through which the general body of alumni make their gifts to M.I.T., has a central role in the Institute's future financing. The report calls for "more effective action by both M.I.T. and the Alumni 'Association in presenting the Institute's need and worthiness and in reporting M.I.T.'s stewardship of the gifts."

Extend M.I.T. club activities so that they serve broader interests and encompass more alumni. "We anticipate the day when the Institute and its public will

look upon the M.I.T. club as the focus and embodiment of the Institute in the local area," said the Committee. An alumni center patterned after the successful New York organization should be established to serve graduates in the Greater Boston area.

With additional resources, develop *Technology Review* into an increasingly effective demonstration of the concerns and standards of M.I.T., a growing factor in continuing education for alumni, and an effective record of the achievements of the Institute. It should circulate to larger numbers of alumni and to many non-alumni, and its frequency should be increased from nine to 10 issues.

Develop plans for an alumni house or on-campus hospitality center. "Joint Institute-Association action is urgently required," the Committee said.

Make minor changes in the organization and committees of the Alumni Association to give more effective representation of alumni interests and to provide committee support for all its activities.

A time schedule for implementing the recommendations of the Long-Range Planning Committee is now under discussion by the Executive Committee of the Association, and there was extensive discussion of the report during the Alumni Officers' Conference in San Francisco at the end of September In addition to Messers Lunn, Weedon, and Severance, Central Committee members included Theodore A. Mangelsdorf, '26, President of the Association in 1966-67, and Howard L. Richardson, '31.

Copies of the report of the Long-Range Planning Committee and of the reports of its sub-committees are now available to alumni without charge. Please write to the Secretary of the Alumni Association, Room E19-439, Massachusetts Institute of Technology, Cambridge, Mass., 02139.













At the first "away-from-home" Alumni Officers' Conference: Gregory Smith, '30, President of the Alumni Association, and Howard W. Johnson, President of M.I.T., greeting Jay M. Tenenbaum, '64; Walter A. Rosenblith, Professor of Communications Biophysics, at the banquet; Robert W. Mann, '50, Professor of Mechanical Engineering, on man-machine research on prosthetic devices; a question from William R. Perret, '30; and William H. MacCallum, '24, leading a session for M.I.T. club officers.

Seven Bronze Beavers, the Alumni Association's award for distinguished service, were given at the Conference to those in the picture on the opposite page (left to right):

William J. Sherry, '21—"acknowledged leader for M.I.T. throughout (Oklahoma)."
Denman K. McNear, '48—"A constant source of strength in all Bay Area alumni activities."
John A. Lunn, '17—"has demonstrated the leadership and dedication which inspire his associates and reflect credit on the Institute."
The Class of 1917 (received by Mr. Lunn)—"a bulwark of strength for M.I.T."
William H. MacCallum, '24—"his forceful leadership, advice and counsel have been a source of strength and inspiration."
The M.I.T. Club of Puget Sound (represented in San Francisco by Jacob A. Samuelson, '40, and Andrew T. Hengesteg, '55—"all rejoice in the warm and growing ties between the Club and M.I.T." Charles Diebold, 3d, '58—"manifesting the invaluable contributions that youthful enthusiasm and commitment bring to the world-wide M.I.T. community."



Seven alumni were honored by the M.I.T. Alumni Association at the National Officers' Conference when they received the Bronze Beaver Award. For their names and citations, see the opposite page.

San Francisco: F=ma

The M.I.T. Alumni Association "went national" on September 28 and 29 when nearly 160 of its leaders met in San Francisco. Their purpose was to study the opportunities which the growing role of technology in human affairs gives to educational institutions and those who work for their support.

"We are committed to a new integration of human and technological knowledge, a new relevance of institution to its environment, "Howard W. Johnson, President of M.I.T., told members of the 1967 Alumni Officers Conference in his opening address "We do not want a community of ivy-covered walls where students escape from reality," he said.

The response of alumni, replied Gregory Smith, '30, President of the Alumni Association, should be a new loyalty springing from their realization of "the absolute necessity of what M.I.T. is doing to produce men and women who understand the complexities of our society." He called the Institute's thrust "an explosion of relevancy."

The highlight of the two-day conference was the presentation of the long-awaited report of the Alumni Association's Long-

Range Planning Committee, (see report in Alumni Review). Rapid changes in the Institute and its involvements in urgent national problems must be matched by changes in the Alumni Association's organization and in the scope of its programs, members of the Committee said.

President Johnson told the alumni that M.I.T.'s power will derive chiefly from "our ability to enlarge the strength and service of science to society." The Institute especially seeks to engage its students, he said, in a way which provides full opportunity for "expression of creativity, fulfillment, and hope."

Kenneth R. Wadleigh, '43, Dean of Student Affairs, continued this discussion by noting that M.I.T.'s concept of the dignity of useful work, first expressed by William Barton Rogers as founder, remains unchanged. The faculty is especially concerned that students "find for themselves a constructive role in modern society." Student response to this environment is positive, he said; undergraduates come to M.I.T. to achieve important goals, and they quickly become partners in the enterprise because of the "remarkable candor which characterizes the relationship of students, faculty, and administration" on the campus.

"The biggest deficiency in our program for undergraduate education today," Dean Wadleigh said, "is the problem of student residence, and in this area we face a crisis. Fully half of our student body live in conditions of which we are ashamed,"

At the more practical level of policies and programs, most conference sessions stressed the roles of alumni in communications and public relations with and for M.I.T. There were detailed discussions of the roles of clubs, class and course organizations, educational counselors, and *Technology Review* in these fields. In parallel meetings, 1968 Alumni Fund workers made extensive plans for the year which included new goals for alumni support of M.I.T.

As the meeting adjourned for San Francisco sightseeing and shopping, Mr. Smith called it "a 24-hour kindling of our spirits." For all those present he offered a new definition of F=m a: "the harder you push the faster you go."

Registration for the 1967 Alumni Officers Conference, the first to be held off the campus, was 157—almost half of whom came to San Francisco from east of the Mississippi River. There were 64 wives who were made welcome at the sessions.

Southern California: Undergraduates Advise Freshmen

The M.I.T. Club of Southern California hosted a dinner for 16 entering freshmen and 28 undergraduates on July 8 at the Altadena home of Robert Welles, '15. Members of the Club and the Educational Council found it refreshing to chat with these young people and explore their perspective on the fast changing environment at M.I.T.

The real highlight of the evening was a panel discussion on how to get the most out of M.I.T. education by undergraduate students Clyde Rettig, '68, Mary Gordon '68, Sherry Gulman, '68, and moderator, Bob Bosler, '67. The students were nearly unanimous in pointing out the dangers of total immersion in core courses for the sake of scholastic achievement. They urged a more open-minded attitude on the part of new freshmen, suggesting explorations to find areas of study which are most stimulating. When a student finds the field which really interests him and immerses himself in studying that field, the students agreed, the professors and research staff open themselves up to provide the encouragement and help which make for a rich and rewarding educational experience. One of the panel members concluded by stating, "Tech is really a fun place if your attitude is right; and the school offers so much that you can't help but get a great education."

Earlier, on July 23, members of the Board of Directors of the M.I.T. Club of Southern California were invited by George M. Cunningham, '27, to a bon voyage party on the S. S. Canberra, on which the Cunninghams sailed from San Pedro for a trans-Pacific voyage.—Edwin C. Bell, '58, Secretary, 139 Annandale Road, Pasadena 91105

Japan: Educational TV

The visit of James R. Killian, Jr., '26, and Professor and Mrs. Jerrold R. Zacharias in Tokyo late in June provided the occasion for a meeting of the M.I.T. Association of Japan. The alumni and guests enjoyed hours of reunion and pleasant conversation at the Japan Industry Club, Marunouchi, Tokyo, on June 23. Dr. Killian and Professor Zacharias were in Tokyo to study the situation of educational television in Japan, and much of the evening's discussion centered on this topic, including Dr. Killian's experiences as Chairman of the Carnegie Commission on Public Television.-Hiroya Fujisaki, S.M. '59 Secretary, Department of Electronic Engineering, University of Tokyo, Bunkyo-Ku, Tokyo, Japan

Northern California: Education of the Brain

What are the limits of human knowledge? Is the human brain capable of knowing and understanding itself completely?

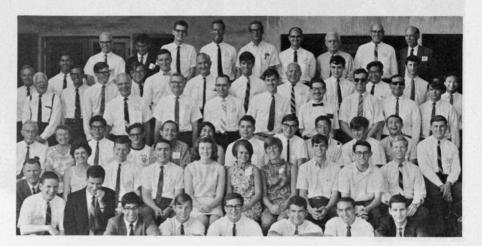
Do we know enough about ourselves to conceive of what our world will be

like when we have fully committed human brain power to it?

To answer questions such as these, says Walter A. Rosenblith, Professor of Communications Biophysics at M.I.T., our present-day glimpses of the science of the brain are far too primitive. The problem, he says, is that "We cannot ask meaningful questions about the system performance of the brain. We shall not understand the brain," he says, "until all the sciences it has created have contributed to the effort."

Dr. Rosenblith's remarks were made before a dinner meeting of the M.I.T. Club of Northern California and the 1967 National Alumni Officers Conference at the Fairmont Hotel in San Francisco on September 29. He chose his topic, he said, because the brain is the human organ most closely related to education an example, in a sense, of the melding of science and human affairs which was the theme of the Officers Conference.

The brain is man's greatest resource, says Dr. Rosenblith, and man's greatest crime against himself may be to fail to put all the neurons in every human's brain to work. Electrical and chemical methods have led us to increasing knowledge of how the brain functions, and we are convinced that it is a uniquely exquisite and powerful organ. But we dare not base our educational systems of the next 30 years on what we now know of the brain and how it works. Only a substantially increased investment in research can give us "the basic assurance that we shall not fail," Dr. Rosenblith declared. Too many questions still have no answers.



Undergraduates and entering freshmen enjoy a dinner on July 8 hosted by the M.I.T. Club of Southern California.





At the M.I.T. Association of Japan on June 23: standing: Shigebumi Saito, President of the Association; Elichi Goto; Hiroya Fujisaki, S.M. '59, Secretary of the Association; Kyuchiro Washizu, '54; Masaru H. Miyauchi, S. M. '29; Teruyochi Udoguchi; Yoshinori Chatani, '22; and Stanley H. Hillyer, '50; and seated: Mrs. Ikehara; Mrs. Chatani; Shikao Ikehara, '28; Jerrold R. Zacharias, Professor of Physics at M.I.T.; Mrs. Zacharias; and James R. Killian, Jr., '26, Chairman of the M.I.T. Corporation.

To the left James R. Killian, Jr., '26, speaks at the dinner meeting held June 23.

Club Calendar

New York—dinner meeting at the Carnegie International Center for Peace on November 2: Seymour Topping, Foreign News Editor of the New York Times on "China and Southeast Asia—the Limits of Chinese Communist Influence."

Northern New Jersey—dinner meeting on November 9: Halsey C. Herreshoff, S. M. '60, M. I. T. Instructor in Naval Architecture and Marine Engineering, on yacht design and the America's Cup competition.

Boston—luncheon meeting on November 9 at the Union Oyster House.

Los Angeles—family outing on November 11 at Point Magu for the Air Force Air Show.

New York—luncheon meeting at The Brass Rail, 100 Park Avenue, on November 15: Captain Ray M. Pitts (U.S.N. Ret.), Vice President of Ocean Systems, Inc., on "Underwater Research and Development."

New York—two-day introductory computer seminar at the I.B.M. Product Display Center on November 16 and 17.

Alumni Council—dinner meeting on November 27 at the M.I.T. Faculty Club: Dr. John Knowles, Administrator of Massachusetts General Hospital.

Washington, D. C.—afternoon seminar on November 18 at the Institute for Defense Analyses: urban problems.

St. Louis—dinner meeting on November 28: James R. Killian, Jr., '26, Chairman of the M. I. T. Corporation, guest of honor.

New York—dinner meeting at the Carnegie International Center for Peace on November 29: Nevin S. Scrimshaw. M.I.T. Professor of Nutrition, on "Feeding the Expanding World Population."

Rochester. N.Y.—dinner meeting on November 29: Laurence R. Young, '57, M.I.T. Associate Professor of Aeronautics and Astronautics, on "Trends in Air Transportation."

Minneapolis—dinner meeting on December 4: Robert A. Alberty, Dean of the M.I.T. School of Science.

Chicago—dinner meeting on December 5 at the University Club: Robert A. Alberty, Dean of the M.I.T. School of Science

Puerto Rico—dinner meeting on December 28 in San Juan: Howard W. Johnson,

President of M. I. T., guest of honor.

Washington, D. C.—Christmas holidays meeting on December 28 at the Cosmos Club.

Boston—luncheon meeting on January 11 at the Union Oyster House: Irwin W. Sizer, Dean of the M. I. T. Graduate School.

Central Florida—"Alumni Florida Festival" on January 27 in Orlando: James R. Killian, Jr., '26, Kenneth R. Wadleigh, '43, M. I. T. Dean of Student Affairs, the Logarhythms, and others.

Boston—luncheon meeting on February 8 at the Union Oyster House: William W. Seifert, Sc.D. '47, Assistant Dean of the M. I. T. School of Engineering.

Washington, D. C.—afternoon seminar on February 15 at the Institute for Defense Analyses: ocean engineering.

Philadelphia—day-long Regional Conference on March 9 at the Sheraton Hotel: Former President Dwight D. Eisenhower, Howard W. Johnson, James R. Killian, Jr., '26, Irwin W. Sizer, and William S. von Arx, Sc. D. '55, M. i. T. Professor of Physical Oceanography.

Mexico—Annual Fiesta of the M. I. T. Club of Mexico on March 14-16 in Mexico City.

Dallas—day-long Regional Conference on March 30.

Cambridge—class reunions on June 7-9 and Alumni Day on June 10.

Deceased

W. Channing Brown, '91, Edward Earl, '91, April 24 Judsen C. Dickerman, '95, August 27 John S. Eynon, '96, April 11 Donald N. Alexander, '98, January 9' Frederick C. Gilbert, '98, June 26 Arthur L. Goodrich, '98, July 10 Charles D. Drew, '99, March 22 John R. Marvin, '02, June 28* Warren C. Taylor, '02, July 24* William R. Crowell, '04, Emery J. Wilson, '04, April 22 Mildred Eleanor Blodgett, '06, March 13 E. Harley Daniels, '06, John Gooding Doten, '06, January 6 James H. Means, '06, September 3 William A. Young, '07, March 25* Charles A. Kraus, '08, June 27 John J. Mullen, '08, July 8 Frank D. Applin, '10, Carrol R. Benton, '10, July 22* Frederick A. Dewey, '10, July 27* Francis B. Silsbee, '10, August 21 Fred H. Daniels, '11, June 15 Henry C. Frisbie, '11, May 24

Ralph M. Ferry, '12, May 23* Charles J. McCarthy, '13, August 7 J. Warren Horton, '14, May 10 Donald W. Parsons, '14, May 26 Gilbert A. Wagner, '14, July 19 George E. Whitwell, '14, July 5 Augustine J. Caffrey, '15, June 29' Alfred V. Coleman, '15, August 22 Thomas D'A. Brophy, '16, July 29* Frederick C. Bryant, '16, June 21 Robert A. Crosby, '16, June 2 Harold P. Gray, '16, May 20* John A. Kelley, '16, March 17 Iu-Shing Wan, '17, November 26, 1966 O. Donn Burton, '18, May 17* Edward S. Carter, '18, February 10* Arthur J. Marsh, '18, May 26 Walter Robinson,'18, July 13* Hyman G. Spector, '19, July 9* Miss Mary Almy, '20, July 29 Robert A. Miller, '20,* Hamilton J. Bickford, '23, July 13* James E. Brackett, '23, July 29* Lawrence E. Duane, '23 Henry M. Kendall, '23, January 13 Howard B. Keppel, Jr., '23, July 19, 1965 Henry N. Landis, '23, April 28 John P. Nissen, Jr., '23, March 11 Frederick Westman, '24, September 16* Harold G. Young, '24, April 29 John G. Dempsey, '25, June 15* Leon T. Gregory, '25, August 23 Weldon Heald, '25, July 29* Edward H. Hewitson, '25, June 20* Kenneth C. Prescott, '25, May 24* Philip Loew, '26, March 28 Nicholas R. Samaka, '26, June 18 Arnold M. Greenhalge, '27, May Maneck P. Kanga, '27, July 3 John M. Kochanczyk, '27, July 10 William L. Sullivan, '27, March 17 Edward Birkenwald, '28, June 14* Fred B. Brown, '28, March 16' Arthur Campopiano, '28, July 29* Charles E. Richheimer, '28, June 16* Alfred Guenther, '29, March 31* Paul F. Hahn, '30, May 3* Zareh M. Sourian, '30, April 16* Joseph T. Wight, '30, Jarvis M. Wilson, '30, August 20 Paul B. Samuelson, '32, April 22* John F. Bassett, '33, July 9 Stanley A. Gilbert, '33, July 9 Dominico Martino, '33, March 13 Alden Packard, '35, January Weldon M. Ray, '35, 1965 Bernard Card, '38, April 1* Courtland C. C. Hill, '40, August 2* Merton L. Robinson, '42, May 6 S. Edward Yoder, '42, Charles Antoniak, '44, June 3 Sylvan L. Cahn, '48, July 3 Ralph F. Romano, '51, May 23 Arthur A. Becker, '53, June 29 Fermin Carrillo-Hernandez, '53 Ralph F. Gilbert, '55, April Tuure I. Wirkki, '56, May 13 Aviva Rubin Tepley, '58, June* John A. Bergeron, '59, May 22 H. James Stockley, '64 * Further information in Class Notes.

Class Review

96

News for your Class Secretary was received in the following note from the Alumni Office. "I am still going strong for my age, 93 on April 25. Nothing serious the matter with me. Also my charming wife, Capitola, is in fairly good health. We were married June 17, 1901, and had only one child, (Jean born in 1903) an M.I.T. graduate, employed now by the U.S. Navy to inspect electrical equipment on ships being made ready for Viet Nam. I still play the piano every day as well as I can with stiff fingers. Charles E. Batchelder, '96.' John Eynon's nephew, Stuart J. Eynon, '13, sent me an answer to my note of inquiry. After graduation John went to New York City and worked for the street railway company there, supervising the installation of what was probably the first underground electric trolley system ever installed. It was on Third Avenue and 125th Street. When that was completed, he was employed by the John C. Paige Company of Boston, a large insurance company, to have charge of insuring street railway properties all over New England. He was connected with this company until he retired about 1930 and moved to San Diego, Calif. He lived there until his recent death, April 11, 1967. He had been very active in church work, and contributions to several parishes, in time, work, and financial aid had been very substantial."

The Alumni Office sent a new address for Charles G. Hyde, namely c/o Mr. A. Van U. Dunn, 2275 Marin Avenue, Berkeley, Calif. 94707. Mr. Dunn, Charles' sonin-law, answered a letter to Charles telling me that the change was for health reasons and that he and the family were very hopeful that our President would recover his health as he had done previously. Mr. Dunn is a Dartmouth graduate from the Thayer School in engineering.— James M. Driscoll, Secretary, 129 Walnut Street, Brookline, Mass.

98

Here is the Class of '98 again (after ten months) with an Acting Secretary. Perhaps one of you members will offer to be the Secretary? Joe Riley and Bob Lacy refused because of pressing duties. As you recall, the previous class news was in the December 1966 issue, an obituary of my father, Frederic A. Jones, who was your Secretary. Among his papers I found a letter concerning classmate George K. Newbury written by

his son, Allan, who is a sales engineer with a firm in Oak Hill, W. Va. George retired over 20 years ago and lives with his daughter, Olive N. Buckley, at 525 Fourth Avenue W., Hendersonville, N.C. There are 3 other children: Russell, a sales engineer with a firm in Atlanta. Ga.; Gilbert, an office engineer with Chrysler Motors in Detroit, Mich.: Kenneth, a sales engineer operating his own business out of Green Bay, Wis. George continues to be interested in gardening and other activities around home. His special interest in the summer is his crop of tomatoes, while all year long he works on his compost piles to improve his soil. Being an engineer by education and experience he is also interested in maintenance around the house involving wiring, carpentry, plumbing, and so on.

As far as I know, the following names have not been listed in the '98 news. IN MEMORIAM 1965-1967: Donald N. Alexander, Roger W. Babson, George H. Booth, Chester F. Drake, Fred C. Gilbert, Arthur S. Keene, Eugene W. Rutherford. You no doubt read in the Review and in the newspapers about Roger Babson; so I will not repeat. If you have clippings of others mentioned, please mail to me. I do have two clippings that will now be shared with you. The Rev. Cannon Donald N. Alexander, 91, of 20 Catherine Street, Worcester, died January 9, 1967. Born in Boston he lived in Worcester for 49 years. Cannon Alexander was honorary canon of Christ Church Cathedral in Springfield since 1940 and rector of St. Mark's Church, Leominster, until 1918 when he became rector of St. John's Episcopal Church, serving until 1946. He was a graduate of M.I.T. Class of 1898. He graduated from the Episcopal Theological School, Cambridge, in 1904. He was ordained a deacon in June of the same year and priest in 1905. He was deputy to the Synod of the Province of New England from 1915 to 1923. He was secretary of the commission on church architecture, province of New England, for 50 years. He was a member of the Board of Missions, Diocese of Western Massachusetts for 18 years and Dean of the Worcester convocation of the Diocese of Western Massachusetts for three years, and he was the author of the History of the Diocese of Western Massachusetts, 1901 to 1951. He leaves no survivors.

Frederick C. Gilbert, classmate in Course V, died on June 26, 1967, in the Community Hospital, Hemet, Calif. Gilbert who had a national reputation in the smelting industry, was listed in *American Men of Science* and *Who's Who in Engineer-*

ing. He wrote numerous papers for scientific and technical journals. Born in Cambridge on February 18, 1876, he was graduated from M.I.T. in 1898. From 1898 to 1906 he was Assistant Superintendent of the Eilers plant of the American Smelting & Refining Company, Pueblo, Colo.; from 1906 to 1910 Superintendent of the company's Durango plant; 1910 to 1918 Manager of the Durango plant and from 1918-1922 Assistant Manager of the company's entire Colorado operation. From 1922 to 1927 he operated his own offices as a consultant mining engineer in Denver, Colo., and from 1927 to 1931 was Professor of Metallurgy at Montana University School of Mines, Butte. When he left the University he resumed his private practice as a consultant in Butte. From 1938 to 1951 he was Director and Stabilization Officer of the Montana Unemployment Compensation Commission, Helena. He was retired in 1951 and for a year lived at Wildomar, In 1952 he moved to Hemet where he became active in the Unitarian-Universalist Fellowship, a unit of the Unitarian Church of Los Angeles. He is survived by his widow, Maud C. Gilbert, of the home address in Hemet: 40681 Johnston Avenue. . . . There are 15 classmates very much alive. Look for their names and addresses in the December issue.-Mrs. Audrey Jones, Acting Secretary, 232 Fountain Street, Springfield, Mass. 01108

02

Our Alumni Day gathering was very small. Arthur L. Collier and Mrs. Collier, Chauncey Manning, and myself were all that showed up at our table and 65th Reunion. Naturally it was disappointing but not unexpected. The letter sent to all members of the Class did however bring news from several. Bill Kellogg who had expected to attend had an upset in his health a short time before the date, was advised not to attend and had to cancel his reservations. And the Lewis Moores could not make arrangements in time to get north and be with us as had been expected. Frank K. Mitchell wrote that he was still active but had already made arrangements for that date. Carlton Allen no longer drives his car and found it impossible to be with us while Ambrose Bourneuf had been hospitalized since February. He is now fully recovered. Letters were also received from Albert Lombard and Grant Taylor expressing regrets that they could not come but wishing to be remembered to all.

The letter sent to Robert Baldwin's last

known address in Vermont brought back the information that he had died in Carlisle, Mass., on February 22, 1964, in his 84th year. Two other deaths to be recorded are those of Emanuel Gorfinkle and John R. Marvin on June 28. 1967. The following data is from a clipping from the Waltham News-Tribune given us by his daughter, Mrs. Nemzoff. "Emanuel Gorfinkle (89) of 500 Dedham St., Newton Centre, died suddenly this morning. For 25 years he was Vice President of the B. S. Edward Company, West Newton, founded by his son, Edward J. Gorfinkle of Waban and was known as 'Mr. G. Sr.' in the store where he remained active through last Saturday. He was born in Boston and starred as a quarterback at Chelsea High School. A 1902 graduate of M.I.T. he was an electrical engineer and one of the founders of the Hytron Corporation in Salem, Until the death of his wife four years ago he had lived in Brookline. Since then he had made his home with his daughter, Mrs. Helene Nemzoff. He was a member of Shawmut Lodge, AF & AM of Boston, a member of Temple Israel, Boston, and was one of the first members of the New Century Club of Boston. He is also survived by another daughter, Mrs. Aaron Gordon of Brookline, five grandchildren, two great grandchildren, a brother, Col. Bernard Gorfinkle of Brookline, who is on Gov. Volpe's staff, and a sister, Mrs. Clara Horblit of Newton Centre." It is of interest to the Class that Gorfinkle's son, Edward, is the official Class baby, duly elected as being the first boy baby born to a member of the Class. The Class presented Edward with a silver mug, and we understand that he still possessed it until it was lost through theft about four years ago.

John Marvin was born in Brookline, Mass., January 22, 1879. He attended Cornell before entering M.I.T. with the Class of 1902. Upon graduation he entered the employ of B. F. Sturtevant & Company as draftsman and also did some selling for that firm, being for two years in their Chicago office. He then shifted to the Holtzer Cabot Electric Company in Boston and remained with them until 1909 when he became New England Manager of the Diehl Manufacturing Company. He resigned in 1911 to become Manager of the St. Paul office of the Western Electric Company but later returned to the Diehl Manufacturing Company to be Sales Manager of their Chicago office and still later of their Philadelphia office. He remained with that firm until 1937 when he resigned and started the firm of John R. Marvin & Company in Philadelphia as sales engineer representing various companies including J. L. Gleason & Company. In 1950 he gave up all the accounts except Gleason which he retained until he retired from active business. After his retirement he took up his residence in Colorado, first in Evergreen and later in Denver where he resided at the time of his death. In 1911 he married Grace Field of Denver who pre-deceased him. He left two daughters, Mrs. J. R. Anderson of Kittredge. Colo., and Mrs. Jeanne Phillips of Bucks County, Pa., and six grandchildren.

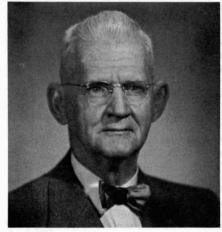
After these notes were thought closed, news has come of the death of Warren C. Taylor, retired professor of the Department of Engineering, Union College, Schenectady. Taylor after graduation from M.I.T. was first assistant engineer for the C.C.C. & St. Louis R. R. until 1905, then for a year draftsman for the Detroit River Tunnel Company. He was then assistant chief draftsman from 1906 to 1907 for the Erie R.R. but returned to the Detroit River Tunnel Company as chief draftsman from 1907 to 1909. After a year as design engineer with the Trussed Concrete Steel Company he joined the faculty of Union College as instructor of surveying, building construction and themodynamics. He became assistant professor in 1913 teaching railroad surveying, structure heating and ventilating. In 1921 he became associate professor. and full professor in 1944. He was department chairman when he retired in 1950. Taylor was very active in church and community affairs and a member of many professional societies. He is survived by his wife the former Amy L. Brain whom he married in 1905 and a daughter, Miss Elizabeth Taylor of York. Pa.—Burton G. Philbrick, Secretary, 18 Ocean Avenue, Salem, Mass. 01970

05

Our 62nd Reunion was again a success both in number attending and in Class spirit and general elan (cross-word puzzle word). For the first time in my memory wives of our departed classmates attended and were cordially welcomed, namely Mrs. Elizabeth Babcock and Mrs. Mildred Stevenson. Both attended the Memorial Service for M.I.T. Alumni at the M.I.T. Chapel then sat at the '05 table at the luncheon. Present also at the luncheon were Leonard and Beatrice Cronkhite, Myron and Rose Helpern, Gilbert and Elizabeth Tower. Bert Files and daughter-in-law, Sheri, Art Balkam, Henry Buff, Gil Joslin, Hub Kenway, Doc Lewis, Bob McLean, Izzy Nye, Herman Gammons and Ruth and I. Without referring directly to the aging aspect of our reunions, I will quote an item from Modern Maturity, a publication of the A.A.R.P., namely, "My uncle was invited to a class reunion, but said he wasn't going this year because, 'every time I go to a class reunion I find my classmates are so fat and bald that they hardly recognize me'." . . . The program at the Memorial Service lists the names of 15 '05 men and two coeds reported deceased June 1, 1966, to June

In going over my material for class notes I find I have not mentioned an interesting "Our Impressions of the Green Valley Community 1966-67," written by Leonard Cronkhite. It sounds as if he were the publicity executive for the G.V.C. near Tucson, Ariz., where he and Beatrice spent a very enjoyable vacation this past summer. It certainly is intriguing, and I hope Leonard and Beatrice may enjoy what they call "the most" (my words, not theirs) for many years to come. Hal Robbins and Roy Allen com-

fortably situated in Phoenix might do a bit of arguing on this. . . . Charlie Smart, II, writes that he and Isabell had made full plans for being at the Alumni luncheon in June, but he had to be rushed to the hospital (2 a.m. May 31), on account of a slight heart attack, where he was confined for three weeks. We have to assume that he is now in good shape-considering. In June the directors of the W. and L.E. Gurley Company changed the title of the Gurley Museum of Surveying Instruments to the Gurley Museum, Charles E. Smart Collection of Surveying Instruments, which is undoubtedly an apt and belated credit to Charlie. He says, "We have 150 American made surveying instruments in the collection and the end is not in sight." So, make a trip to Troy, N.Y., and see this, the world's greatest. . It's a long time since we have heard from Laurence U. Fuller who has been an invalid for some time. Remember Lawrence and those bull-like rushes when we beat '04 16-0 in 1901? I am looking at the picture of this team in the 1903 Technique. What burly fellows with their turtle neck sweaters, all deceased now except Fuller and Hub Kenway. These same fellows with the help of Crowell, Schonthal and Lombard made it a clean sweep in 1902, defeating '06 18-0. I have a letter from Fuller's former partner, Roger C. Lummus of Lynn, Mass., in which he reports: "Your classmate, Laurence U. Fuller, is a patient in the Jesmond Nursing Home in Nahant, Mass. Three years ago Thanksgiving day he suffered a slight pin-point shock and fell from the stairway of a relative's home in Keene, N.H., and suffered a broken collar bone. After a reasonable period in a Keene, N. H., hospital he, being unable to care for himself, had to be placed in a nursing home where necessary care and comfort could be given him. We visit him frequently and report to you that he enjoys good health, but we must admit that he has lost interest in current events and does not appear to look forward to our future visits."



Willard E. Simpson, '05

Because of some very close contacts with **Willard E. Simpson**, I, during the past four years it is very difficult to sense his passing on June 6, 1967. It is also very difficult to sift through the many obitu-

aries from San Antonio newspapers. Perhaps the best summary of his life is in the front page caption, "Skyline Builder Dies." And another—"Mr. Architect and Engineer." J have selected, however, a compilation, written by a business friend, and I quote: "Willard E. Simpson, distinguished American engineer who played a major role in creating San Antonio's skyline, was born in the Alamo city on May 8, 1883. His parents were Mr. and Mrs. Willard Lloyd Simpson, pioneers in the early days of Texas. His ancestors settled in Massachusetts in 1628, just eight years after the Mayflower landing, and his forefathers were among the patriots who fought for Texas independence. One of his ancestors, Robert Grossman, an uncle, was among the heroes of the Alamo. Mr. Simpson attended private schools in San Antonio including the old McGruders and Texas Military Institute, known then as West Texas Military Academy. He was a member of the class of 1901. Among his friends and older classmates in those days was General Douglas MacArthur. He was graduated from Massachusetts Institute of Technology with a bachelor of science in civil engineering in 1905, wtih a specialty in structural engineering. His first job was with the Southern Pacific Railroad in Tucson, Ariz., and a year later he returned to San Antonio to begin his long and successful career here. An early job was as structural engineer designer for the original St. Anthony Hotel. He established his own firm, W. E. Simpson Company, consulting engineers, in 1909 in association with his brother, Guy Simpson '06 M.I.T. In the intervening years he was structural engineer for major buildings in other Texas cities in addition to his native San Antonio. Mr. Simpson and his firm were the structural engineers for the Tower Life Building, National Bank of Commerce Building, Nix Professional Building, Joske's of Texas, Medical Arts Building, Granada Hotel, Joe Freeman Coliseum, Thomas Jefferson High School, Sears Romano Plaza and Sears Southside, Asamo Stadium, Villita Assembly Hall and the Federal Building, among many others of importance in San Antonio. He and his firm did the complete design and supervision of construction for the Baylor University football stadium, and the stadium addition press boxes for A and M College. He also did the structural engineering for the Federal Building in Austin and Galveston, the El Paso Natural Gas Company Building in El Paso and Gulf and National Standards Buildings in Houston. Mr. Simpson married Miss Mary A. Spencer of Galveston in 1915. They had three sons, Willard E. Simpson, Jr., associated with him in the engineering firm, Radcliffe Spencer Simpson, a graduate of the United States Military Academy, who was killed in action on D-Day in World War II in 1944. The third son, Robert, died in childhood. Mr. Simpson was a life-long member of St. Mark's Episcopal church. For more than 50 years he was most active in Masonry and held many high offices in its related organizations. He was chairman of the Board of the Trustees of the Scottish Rite bodies for a number

of years. He was a past Potentate of the Alzafar Shrine and Commander of its drill team, past Sovereign of the Red Cross of Constantine and past Commander of the Commandery of the Knights Templar. Mr. Simpson served as President of the Texas Society of Professional Engineers and the Texas Section of the American Society of Civil Engineers. In 1955 he was named "Engineer of the Year" by the Bexar Chapter of Professional Engineers. He served as a member of the Board of Trustees of the City Public Service Board for 11 years, five as Chairman. He served as President of the Rotary Club of San Antonio and was an early member of the Order of the Alamo and San Antonio Cotillion Club.' . I might add that Willard and his brother Guy '06 worked their way together through M.I.T., also that his son, Willard '40, is continuing the business.

When I saw Myron Helpern at the Alumni Day luncheon in June, I had not the least idea that I would be writing his obituary less than three months later. He had just opened another Touraine Store, had been the guiding hand in the inside design, and seemed full of energy and courage. He had been at his desk all day Friday, August 25, went home, ate his supper, went to bed apparently in good health; his heart stopped beating during the night. Ruth and I talked with Rose as soon as we heard of it and assured her of the sympathy of his classmates, especially those who had enjoyed Myron and Rose at our reunions, at which they were always loyal participants. He was really a self-made man and a merchant of the Gimbel, Macey type. The Boston Herald gives this data, which is altogether too brief: "Myron E. Helpern of 201 St. Paul St., Brookline, President of Touraine Stores, died Friday at his home. He was 83. He came to this country from Russia as a young man and was graduated from English High School in 1901 and from M.I.T. in 1905 where he studied chemical engineering. He founded the Stein Club at M.I.T. and was a member of the University Club. He was active in charitable organizations. He leaves his wife, Rose (Shapiro) and five children; Miriam Stoneham of Boston, Saul B. Helpern of Chestnut Hill, David M. Helpern of Newton, Ruth Wallace of Longmeadow and Leah Ottenstein of Belmont; 10 grandchildren, and three great grandchildren." . . . I also have to report the deaths of Winfred Taylor, I, on March 14, 1967; Chester Allen, I, in March 1967, and Percy Goodale, date as yet undetermined. I have letters from their daughters, also newspaper obituaries, which I will report in the next issue due to lack of space in this, a voluminous issue. Incidentally, Lloyd Buell has sent me a life-story on Joseph Daniels from a national mining journal which I will send to anyone who asks. -Fred W. Goldthwait, Secretary, Box 32, Center Sandwich, N.H. 03227

06

A year ago, in expressing the hope that you had enjoyed a summer sojourn

somewhere during "those warmer weeks," I said they were really hot in N.E. But not this year-fog, rain, more fog, high humidity, more rain. As usual we spent a week on the coast of Maine and saw the sun the first day! Did you have good weather and a good time? At the end of the July notes I suggested that you drop us a card from somewhere, and one did come from Harry Fletcher, II, and Mary. They were spending a few weeks in Harry's hometown of Portland, Me. The card, by the way, was about Portland Head Light, "The first lighthouse built by the U.S.A." A couple of cards of a sort came from an Alumni Fund mailing: George P. Shingler, V, from Lake City, Fla., allowed he is retired but can walk a couple miles a day; Samuel Greeley, XI, from Chicago reported nothing unusual and still working well at 84. Through the years Sam has indeed been working well, and last June the American Society of Testing & Materials took notice of that fact by giving him its Award of Merit for "contributions of leadership, integrity, and uncompromising adherence to quality . . . in lending to ASTM committee work 50 years of distinguished international experience in the fields of water supply and sanitary engineering." The award, one of 24, was presented at the luncheon held during the 70th ASTM annual meeting in Boston.

On Alumni Day we drove in and parked on West Campus among hundreds of cars from various states. In the Great Court the rhododendrons were in full bloom and beautiful, everything shipshape, with the hundreds of tables under what seemed like an acre of canvas. We soon found the 1906 card on the end of a long table opposite the very long head table on its elevated platform with beautiful bouquets here and there. Flowers were on our tables too. This year instead of having a caterer, the lunch was prepared and served by the M.I.T. dining service and was good. Three of the faithful joined us: Sherm Chase, Bill Abbott and Walter Davol who said he was planning to visit a son in or near Portland, Ore." A few letters arrived last spring, too late for the July notes. Guy Ruggles, III, who has been quite regular in attending reunions and Alumni Days, wrote in answer to my query that he could not be with us this year. In the May notes I told of his operation for a cataract. That was the left eye, and in May it was his right eye. So we missed him and sister Helen last June. By now Guy probably has contact lenses and we hope is enjoying them. . . . Had a welcome newsy letter last June from Ed Bartlett, VI. In 1916 he married Julia Foster, and they have quite a family-5 children, 15 grandchildren, and 3 great great grandchildren. Ed retired in 1944 after many years with the Milwaukee Stamping Company as Secretary, Treasurer, and President. To quote, "I look back with great pleasure to my years at the Institute. Not only did I enjoy the work, but I heard wonderful music, saw good shows, and sailed up the coast with a friend. We now spend winters in an apartment in Phoenix and seem to have good

health out there. If any of the boys come to Milwaukee, I would be glad to entertain them."



Joseph V. Santry, '06

In the July notes I reported the sudden death of Joseph Vincent Santry, VI, on May 9 in Bal Harbour, Fla., where he spent the winter months. Joe's home was in that part of Boston then called Roxbury during his four years with us. We have no record of employment until 1915 when the firm of Schumacker & Santry was handling power plant equipment with offices on Milk St. in Boston. Ten years later he was in N.Y.C. with the Combustion Engineering Corporation of which he ultimately became Executive Vice President, President, and Chairman of the Board. In June 1956 Joe was awarded the Honorary Degree of Doctor of Engineering by Manhattan College (N.Y.C.), and in February 1963 the President of the Republic of Italy conferred on him the rank of Commander in the Order of Merit of the Republic of Italy, the highest honor that the Italian government can bestow on a foreigner. In his letter to me about the award he said that Combustion Engineering had been very active in Italy since the inception of the Marshall Plan, having built some 50 steam generator units totalling 5,000,000 KW, and he believed that the honor had come to him because of his association with the construction of their many power plants. Besides the Florida residence Joe had a N.Y.C. address and spent summers at his beautiful place Red Gate on the shore of Marblehead Neck facing the harbor and including a boathouse and pier and his power cruiser Pleione II. The first Pleione, a racing schooner, was acquired in 1925 and in 1960 she was sailed to the Marine Museum at Mystic Seaport in Connectict and moored there as a memorial to Nathaniel Green Herreshoff, that famous yacht designer who, by the way, was Course II M.I.T. 1870. There are several famous ships and yachts berthed permanently in that Marine Museum, so if you are interested stop in sometime. Joe has been a most loyal classmate through the years, attending many reunions and Alumni Days. He came to our 60th at Charter House and planned to have us all brought to Marblehead to have lunch and a cruise on the Pleione II. There was an unfortunate mix-up and

no cruise, but he commissioned Bob Rose, who lives in Marblehead, to take color pictures of the 50-foot long row of rhododendrons near the house and prepare albums for all those who would have been aboard. Bob did a fine job and the albums were sent to me and long since distributed. They contained 19 pictures of not only the beautiful flowers with close-ups, but also of the house, pier, Pleione II interior and under sail. The business world and 1906 will miss Joe Santry. A note of sympathy has been sent to Mrs. Santry (Mary Augusta Macready) and their daughter Margaret Louise Emmet. There are two grand-

In the July notes I also reported the death on April 20 of Isa Wolfner Kahn, VI, in Chicago where he had lived since Tech days, except for a few years with Carnegie Steel and then a while in his hometown of Peoria. In 1910 Isa married Lucile Kesner and joined her father in the Kesner Realty Trust which controlled several large office buildings in the Chicago Loop area. He was also active in the development of constant mesh transmissions and founded the Hand Transmission Company, Survivors are the widow and a daughter Mrs. Bettie-Rose Rothschild, seven grandchildren, and a son J. Kesner Kahn to whom I am indebted for much of the above. Enclosed with the son's letter was a memo left by his father giving my name and address as Class Secretary. A note of thanks and sympathy has been sent to the son for the family. . . . There are four other deaths to report, careers later: John Gooding Doten, X, in Cohasset, Mass., on January 6; Sister Mildred Eleanor Blodgett, XII, on March 13; Dr. James Howard Means, II, in Boston on September 3; E. Harley Daniels in Natick, Mass., no date. One address change for Frederic E. Earle, II, to Eager Road, Lafayette, N.Y. 13084.-Edward B. Rowe, Secretary-Treasurer, 11 Cushing Road, Wellesley Hills, Mass. 02181

07

The 60th Reunion of the Class of 1907 was held on the Cambridge campus of Massachusetts Institute of Technology June 16 through 19, 1967. Eleven members of the Class attended part or all of the celebration. For the first time in the history of the Class wives were invited, and five came with their husbands. As all of the living members of the Class are over 80 years of age, some of them need help in driving an auto or walking any great distance. The Alumni Association furnished to us very comfortable rooms at McCormick Hall, the new women's dormitory, and also furnished breakfasts to all those attending a class reunion. On Saturday, June 17, a bus tour of the M.I.T. Campus was made. Frank Mac-Gregor has made a gift to the Institute to pay for the erection of a new men's dormitory on Memorial Drive, just west of Burton House. We stopped on our tour and were shown this location and told construction would probably start this

coming fall. Needless to say we all extended to Frank, who was with us, our congratulations and thanks for his interest in our Alma Mater. Then a trip was made through the renewal area of Boston, including the Prudential complex with a visit to the skywalk on the 52nd story.

Saturday evening the Reunion banquet was held at the Faculty Club with James M. Barker of our class and his wife as hosts. The attendance consisted of 11 Class members, 5 wives and 1 guest. We had two coeds who went through the four years of college with '07. One of them married Raymond Parlin, one of our classmates. Ray died many years ago, and we were most pleased to have his wife, Maude Darling Parlin, attend our Class dinner with her son David. Those attending the Class banquet were President Don Robbins and his wife, James M. Barker and wife, Professor Hudson B. Hastings and wife, Harry Hall and wife, Kelley Richards, Stanley Wires, Frank MacGregor, Milton E. MacGregor, Louis Freedman, Mrs. Parlin and her son, and Phil Walker with his wife, making a total of 11 Class members out of 83 now living. Since graduation '07 has held 15 reunions. President Robbins has a 100 per cent record. Phil Walker has missed one; Hud Hastings has missed two; Milton MacGregor has attended eleven: Frank MacGregor, ten; and Stan Wires, nine.

Monday, June 19, was Alumni Day when nearly 1200 alumni from 1896 through 1967 enjoyed the programs offered to them. This was the second year that a Memorial Service was held in the chapel for those alumni who became deceased since last June. 1907 had 15 members so reported in the Memorial booklet that was distributed to those attending and mailed to the families of the deceased members. There is one death to report this month. I have just received a newspaper clipping showing that William A. Young, Course I, of Exeter, N. H., died March 25, 1967. He was the owner of Young's Hardware Company and a retired Vice President of the Exeter Banking Company. He had served as President of the Trustees of Exeter Hospital and Robinson Female Seminary, and was also a director of the Exeter Manufacturing Company and the Swasey Parkway. He has been carried on the Class roll as an associate member. . . . I have not been able to obtain any information relative to Carroll S. Dean, VI, of Chevy Chase, Md. Letters sent to him have been returned with "address unknown." Can anyone help out?-Philip B. Walker, Secretary and Treasurer, 18 Summit Street, Whitinsville, Mass.; Gardner S. Gould, Assistant Secretary, 409 Highland Street, Newtonville, Mass.

09

There were nine of us present at the luncheon on Alumni Day, June 12:
Margaret and John Davis, Chet Dawes,
Barbara and Ben Pepper, Art Shaw,
Laurence Shaw, Henry Spencer, George
Wallis. Tom Desmond, our Vice President,

made every effort to be present but was prevented because of Alice's health. (Tom has written, "Alice is fortunately now greatly improved in health.") We also missed Betty Shaw who for reasons of health was likewise unable to attend. Until a year ago we don't remember her ever having missed Alumni Day. At the luncheon the amount of the Alumni Fund and the especially large gifts of the Classes of 1942, 1927, and 1917 were announced. (For a complete description of the entire program see the July Review, page 52 et seq.) Undoubtedly, you all have received the letter of Theodore A. Mangelsdorf, retiring President of the Alumni Association, which describes its many accomplishments during this past year and of which he spoke briefly at the luncheon.

As stated in the letter of June 28 to members of the Class, it became necessary to elect by ballot a new President to succeed Molly. Also on the ballot was the 60th Reunion preference. The results are as follows: Total ballots received, 51; Art Shaw for President, 51; hotel near Cambridge, 13; M.I.T. dormitory, 20; blank or no choice, 18. Hence Art is our unanimous choice for president. Since graduation, as we all know, he has taken great interest in the Institute and the Class. He has devoted much of his time and has made many contributions to both. We who make plans for the Class activities, especially reunions, have always found his help most valuable. The "blank or no choice" returns are quite understandable as many will be unable to attend under any circumstances and a few were content with either choice. On many of the return cards were personal notes expressing regrets at the passing of Molly and commending the fact that Art has become President. Tom, Chet Dawes and John Davis retain their offices as Vice President, Secretary, and Treasurer, respectively. Art, however, has appointed Henry Spencer to replace himself as Class Agent. Henry continues as our Class Estate Secretary. Fortunately, Art will remain as our Alumni Council Representative.

We received the following note from Jeanne Scharff: "Thank you so much for sending me the Technology Review. I appreciate your article about Molly enormously. It still seems unbelievable that he is truly gone forever. Sometimes I think he will walk in the house full of enthusiasm and plans for a job he was about to undertake. Both Samuel and I are grateful that he didn't have a long illness to contend with, and we know that the way he went was the way he would have wanted to go, yet it is still a shock not yet overcome. I am glad you and Muriel are well." . . . This summer George Wallis and Marcia visited their daughter, Mrs. L. Sanford, at her summer residence on Governors Island, Lake Winnipesaukee. George writes: "Shortly after our arrival at the lake we motored over from Governors Island to the other end at Wolfeboro and had a pleasant and interesting visit with J. N. Stephenson. Steve and his wife Margaret have an attractive apartment on the lake where they settled

down for retirement. After advising of his spending 50 years as Editor-in-Chief of the Pulp and Paper Magazine of Canada, he handed me the enclosed page from Canadian Who's Who which lists his past connection and accomplishments." One page of the enclosure is devoted to the ceremony at Manor Richelieu, Murray Bay, Quebec, at which Steve was presented with an Honorary Life Membership in the Canadian Pulp and Paper Association. Another page tells of Steve's career, some of which has already appeared in these notes. A note on Steve's card states, "Thanks to class officers for their fine work."

In a notation on his card Phil Chase states, "Sorry to hear of Maurice's death. We are here until late fall at our Maine home, Kennebunk Beach, Let us know if you come down this way." . . . We were sorry to learn from Mrs. Haylett O'Neill at Houston, Texas, that her husband has been ill for over a year and is confined to a hospital. Most of us remember the efforts they have made to fly all the way from Texas to attend many of our reunions. We have written Mrs. O'Neill expressing the sympathy of the Class as well as our own. . . . We have received a notice from the Alumni Office of the death of Clarence D. Maynard on March 6. This is very personal to the Secretary for Clarence was one of four of us members of the Class of 1905, Somerville High School, who prepared for and entered the Institute. He was born in Somerville, Mass., August 31, 1886. He married Bertha Marvel, a teacher of French at the high school. While at the Institute Clarence was a member of the Civil Engineering Society. He lived for some time in Belmont, Mass., and moved to Cambridge in 1965. Our records have nothing of his professional activities, and so far we have been unable to learn of them. On Alumni Day a Memorial Service, sponsored by Don Severance, was held in the Memorial Chapel for alumni who deceased this past year. The members of our Class who were so memorialized are: Homer C. Bender, W. Stuart Gordon, Jr., Lewis J. Holliday, Robert I. Hulsizer, Arthur W. Lunn, Henry H. Marshall, Clarence D. Maynard, Joseph W. Parker, F. Gardiner Perry, Maurice R. Scharff, Earl M. Smith, George E. Washburn. . . Owing to the large amount of material received during the summer and because of space limitations, it is necessary to postpone a few items until the December number of the Review.-Chester L. Dawes, Secretary, Pierce Hall, Harvard University, Cambridge, Mass. 02138; George E. Wallis, Assistant Secretary, Wenham, Mass.



I received from Jack Babcock the news that Carroll Benton died on July 22. Carroll was a good source of information from and around New York City concerning classmates and his information will be greatly missed. . . . On July 27 I received a letter from Harold Akerly telling of the death of Fred Dewey. Fred was a very loyal classmate and will be missed at



Harold E. Edgerton, Sc.D.'31, M.I.T. Professor of Electrical Engineering, and Edward S. Howe, '10, pictured at EG&G's annual meeting of shareowners last spring.

future reunions.... Those attending Alumni Day on June 12 were: Mr. and Mrs. Robert F. Burnett, Mr. and Mrs. Herbert S. Cleverdon, Mr. Edward S. Howe, Mr. and Mrs. Ralph W. Horne, Mr. George P. Lunt, Mr. and Mrs. Murray H. Mellish, and Mr. and Mrs. William C. Wallour.... I had the pleasure of having Allen Curtis stop in recently, and we had a very pleasant hour or more reminiscing. Allan appears in good health and is enjoying his retirement.

Last year I had great difficulty in obtaining information from various classmates so I made up my mind I would see what I could do by sending out return reply post cards. The results are most startling: to date I have received more than 50 returns. I intend to spread these over the next four or five issues. Earl W. Pilling, Dedham, Mass., writes that he can find in his 57 years of very miscellaneous civil engineering, almost limited to nearby Dedham, nothing to make an obituary. He has become a deposit of all kinds of physical, geological and historical data for the last 350 years. Cannot orate veni, vidi, vici. Not even elected Dog Office but has often held the office of Fence Viewer! They are still extant, did you know it? "After all. the tent maker has covered all existence with his 'Moving Finger' so why should I try to expand it? Why not be satisfied with the declamation of 'Algernon Charles' with his wearied 'River Winding to the Sea.' I will call it 80 years in December and if by reason of strength it be four score the prophet covers the whole subject. I could say that I headed the loan committee of the Dedham Cooperative Bank for about 30 years and the Dedham Historical Society for about 35 years as Curator and President."

M. Alva Zook, Glen Ellyn, Ill., writes: "This classmate is 87 years old, retired, living with wife, both in good health. Married 54 years. We have two children, both graduates of the University of Wisconsin, and six grandchildren. Our son lives in Los Angeles area, our daughter lives near Boston." . . . Harold Lockett writes: "We all like to read news about our classmates, but most of us don't like to really sit down and write any. My own feeling along that line is that any news I might pass on isn't very interesting to anyone else. Am looking forward in September to a visit by my daughter and family from Dacca, E. Pakistan. Bet you don't know where that is." . . . Chester

Wilson writes: "No outstanding thing has broken the daily routine. I am still working every day 9 to 5 or 6 or 7 as may be required. I expect to join my family next week in Italy, then on my return I may have something of interest. Who knows? They are travelling by camping bus and mixing hotel and camp living to get some of each and a good bath frequently. As you get older life is pretty much routine, and that is probably why you don't get any news. They all feel as I do that they have nothing of interest to share."

George Salisbury writes: "I am still alive and kicking. In fact I am daily at the office and keeping active as Chairman of W. H. Salisbury & Company. Hope you are in the pink also." . . . Eldon S. Clark writes: "My life has contained so little which is noteworthy that I have had no inclination to report on what I have done. I have been retired since 1959 and since then have fallen into a routine which while pleasant has little excitement in it. Became a widower in 1958 but have two daughters living and seven grandchildren. Lost my son in W. W. II. Spend a good deal of time with my family but keep an apartment to retain my independence. Go to St. Petersburg, Fla., each winter where I shuffle and play bridge, mainly. The last two autumns I have taken a cruise-one around the Mediterranean and one to Peru. Expect to go down the east coast of South America this fall." . George R. Lord writes: "I am sorry I have been unable to offer any news of Class interest. My wife and I have lived here in enjoyable but quiet retirement for over 15 years and have had unusually good health for a couple of our ages. But as I have now joined the octogenarians -no travel, no work and my most strenuous activity consists of light yard work." . . . Paul S. Hopkins writes: "I cannot evidence my shame in delinquency in prolonged silence, but really I have not been news worthy. The 50 years following 1910 have been, like Gaul, divided into three almost equal parts, learning to think, gaining experience, and struggling to apply it. Since 1950, meditation trying to understand what happened. It has all been interesting and time too short. Trails have crossed Wm. B. Hargraves and B. C. Huber, both III, 1910. They are as was."

Walter Spalding writes: "Your postal of July 26 was just forwarded from Honolulu for we (Romalda and I) are on our annual summer safari for her teaching classes of teachers of the Spalding Method of scientifically using the phonics of English to teach the accurate reading and writing of English to everyone who lacks these skills, both those in school and adults also. This summer we had classes near Pasadena, at a Worcester, Mass., college, Yarmouth, Me., and now have one at the Dalton School here on E. 89th St. in N. Y. C. All have been fine classes of able teachers. Two weeks ago Jack Babcock, 1910's most reliable and loyal professor and Fred Lufkin spent the whole day driving us 270 miles to Nashua, N.H., and back to Yarmouth so Romalda could give a two-hour talk to 100 teachers at Rivier College. We had a happy 1910 all day reunion and wished you had been with us. We had a week of federal education appointments in Washington so had to fly from Portland to the Capitol with no time to see you or other Bostonians. By the way, if you see the August issue of Jack & Jill at your grandchildren's, you will find our signed editorial to parents on the last page. We may have to fly to Washington again before starting home, via a visit with our son and his family in Cleveland and a holiday in the Puget Sound mountains. We were saddened to read of Fred Dewey's death last week, for we had hoped to see him here."-Herbert S. Cleverdon, Secretary, 120 Tremont Street, Boston, Mass. 02108

11

Anna and John Bigelow of 74 Highland St., Marlboro, Mass., celebrated their golden wedding on June 30. John carrted on an architectural business in his home town for many years. He was City Engineer from 1936 to 1959 and Tax Collector from 1942 to 1944. He is Chairman of the Board of Library Trustees. They have a daughter, Mrs. Paul Parmenter of Northboro, four grandchildren and five great grandchildren. . . . Ormond R. Bean, City Finance Commissioner of Portland, Ore., retired last December and was given a banquet by the Chamber of Commerce honoring him for his 50 years of service to the city. Besides his work for the city in a number of capacities, he was Public Utilities Commissioner for Oregon and saw wartime service as Director of Defense Transport for 16 Middle East countries for the U.S. Office of Defense Transportation. . Two new addresses have come to my attention: Professor G. Arthur Brown, 3432 Gunston Rd., Bldg. 729, Alexandria, Va. 22302; and Oscar J. Gilcreest 272 E. Ankeney Mill Rd., Xenia, Ohio 45385. I have a picture from the Nucleus of the American Chemical Society showing Morris Omansky receiving his 50-year certificate as a member of the society. Only four members of the Class attended Alumni Day: John Herlihy, Omansky, O. W. Stewart and myself. John Herlihy is keeping house by himself since the death of his wife about a year ago and claims to be doing a first class job. Morris Omansky is in happy retirement and O. W. Stewart has rented out his blueberry patch this year and is as active as ever in civic affairs. And I am still working part time for the Nelson Precast Concrete Company. Besides the four members of the Class, Gertrude Stewart and Richard Cohen, Morris's grandson, attended the luncheon. . . . A visit from his daughter's family from California, a grandson's wedding and another's graduation from Williams kept L. G. Fitzherbert away from Alumni Day. . . . Franklin Parker, our Ted's son, sent greetings to the Class. He is a director of Charles T. Main engineering firm and has Stewart's son David as a division head under him. . . . Through the Class notes and with my help Minot Dennett and Roy MacPherson, both of whom have had cataract operations,

got in touch with each other.

A Memorial Service was held in the M. I. T. chapel on the morning of Alumni Day in memory of all alumni whose deaths were reported to the Association between June 1, 1966 and June 1, 1967. The following is the list for our class: David P. Allen, Fred R. Bailey, Frederick W. Covill, Arthur E. Bradlev. Burgess Darrow, Kingsley W. Dennett, George B. Forristal, James A. Gannon, L. Gordon Glazier, Charles A. Linehan, Arthur C. Pillsbury, Theodorus Polhemus, Carl G. Richmond, Arthur H. Rooney, Mrs. Robert Spencer and Stanley N. Whitney. . . . A letter from Allston Cushing last June said he and his wife had gone to Tulsa to stay with their daughter until she recovers from a serious illness. His hobby is the collection of data for the upgrading of the genealogy of the Cushing family. . . . Henry Charles Frisbie died rather suddenly on May 24 of this year in California. He was born in 1888 in Chicago, prepared for M. I. T. at the Armour Scientific Academy and was graduated in civil engineering. He is survived by his wife and three children. . . . During a week the past summer while Alma and I were vacationing on Cape Cod, Ernest Batty, Gordon Wilkes and I got together for an afternoon with Aleck Yereance at his summer home in South Harwich. Robert Morse. who is now living all the year round in Sandwich, Mass. 02563, P. O. Box 554, was invited but was unable to make it. He says packing up and moving twice a year is too much for old folks. Because of his health he has had an electric stair climber installed. . . . A clipping from the Portland, Me., Press Herald announced the death of Mrs. Charles F. Hobson (Mildred Osborne) early in June. —Oberlin S. Clark, Secretary, 50 Leonard Rd., North Weymouth, Mass. 02191

12

We are sorry to advise that Fritz Shepard has tendered his resignation as Class Secretary, a position in which he has served our Class for over 50 years. A vote of thanks and appreciation was extended to Fritz by our Class at the Reunion dinner for his long and faithful service in this capacity. Our 55th Reunion was celebrated at Cambridge, June 9-13, with headquarters at McCormick Hall on the campus. There were 24 enthusiastic members present as well as a loyal group of 13 wives. The program, as arranged by our President, Albion Davis, included a guided bus tour of the campus with Hugh Darden, M.I.T. Estate Secretary, who explained the present and future developments in this rapidly growing complex. We then saw and marvelled at Boston's rapidly expanding skyline, followed by a delightful trip to the Wayside Inn in Sudbury where luncheon was served. Highlights included the cocktail party on McCormick Hall penthouse, a slide presentation showing previous Reunions for 1917 to 1965, and the Class dinner on Sunday at which 30 were present. A short business meeting was

held at which **Ray Wilson** agreed to act as Class Secretary with **Jay Pratt** as assistant. **Jonathan Noyes**, as Class Estate Secretary, outlined his activities, which included visits to classmates throughout the country. He reported a total of nine men who have agreed to contribute appreciable sums, an enviable record of nearly 10%. Let us keep the ball rolling! Entertainment was furnished the Mariachis Folk Musicians from Mexico who later took part in the Alumni Day activities at Kresge.

Referring to the class roster which was recently distributed, there are 100 classmates now living of the 260 listed in the Senior Portfolio, a very high percentage, attesting to the longevity of our members. . . . Al Davis did yeoman's work in arranging the program, and we are indebted to him in large part for the success of the Reunion, which several agreed was one of the best ever held. Al is still holding down a real job as Manager of the Algonquin Club in Boston. . Johnnie Noyes and Caroline still travel a great deal about the country, including visits to 24 grandchildren, and continue to spend their summers at The Lookout in Brooklin on the Maine Coast, where they have gone for over 30 years. . . Fritz Shepard has retired from his business, and he and Betty now have time to take things easier and to enjoy his summer home in Marblehead, Mass. . . . Jim Cook has mostly recovered from the serious auto accident sustained two years ago when he collided head-on with an automobile. It was good to see him and to enjoy his usual dry stories. . Harold Mitchell and Mildred drove on from Buffalo where he is still most interested in his bird studies and is president of the local science society. He

told me he had just published a book on

one unusual species which had entailed

years of study.

We were glad to visit with Cy Springall and Marjorie, whom I think have never missed a reunion. Cy's health has definitely improved, and they travel a good deal, usually spending their winters in Arizona and summers in Andover, Mass. The Springalls have specially invited any of us to visit with them whenever in the vicinity of Scottsdale (325 W. Fourth St.). . . . Jack Lenaerts sheds the years very lightly. Although he spends the winters in Florida, his permanent address is now in So. Yarmouth, Mass., at the Lily Pond Apartments no less. . . . Larry Cummings arrived with his charming new wife, Julie, and they too, have made a special request for any of us to use their residence in Connersville, Ind., as a motel for "as long as you may find us at home." The phone number is 317-825-3912. They have a cottage on Squam Lake, N. H., this summer and have entertained Jim Cook and Harold Brackett, showing them how to catch smallmouthed bass. . . . Willis Salisbury, as usual, made the long trek from Minneapolis to join us. He is now mostly retired, and his sons are running the business. We believe he is taking a trip abroad this summer, and hope to get details on his return. We are sure that if you ever get up

to Minnesota, Willis will find time to show you some excellent lake fishing. . . Harold Brackett arrived with his attractive niece, Eleanor Forbes, whom the Class has already adopted. Harold is now living most of the time in Limerick, Maine, where he can get away from the smokefilled air of northern New Jersey. . . Helen and Harold Manning have moved to an apartment in Woodbury, Conn., quite a change after many years in Waterbury, where they are both still engaged in community and church projects. They share a hobby for covered bridges with your Secretary and each year make several "bridging" trips about the country. . . . We were pleased again to welcome Priscilla and Jay Pratt, who had had to miss their first reunion in 1965 due to his serious throat operation. Jay has made a remarkable recovery and is now able to carry on with but little difficulty. The Pratts still maintain their Chicago and Acapulco residences and find time for various civic activities, including Priscilla's Girl Scout work at the national level in Mexico. They, too, plan a Maine vacation this summer. . . . Wallace Murray is another classmate whom time has changed but little. He still keeps active as a consultant in organic chemistry with Arthur D. Little in Boston. . . . Jerry Hunsaker, Fred Busby, Bill Collins, Agnes and Arch Eicher, Phyllis and Hamilton Merrill, the John Barrys, the Walter Langs, Charlie Webber, Phil Dalrymple and Robbert Stobert were also with us for one or more of the events, but unfortunately we had no opportunity to obtain current news of their activities.

Some news was obtained from notes on the blank sent to all regarding the Reunion. Roy Glidden advised he suffered a stroke last February from which he is fortunately recovering. . . . Charlie Cary could not be with us as he had planned to attend his grandson's graduation at Bowdoin. . . . John Hargrave wrote from Georgia, "too old to drive, and air service north from Thomaston is very poor." . . . Guy Swenson wrote, "legs are not much good." . . . Bill Lynch said he is physically well but decided not to take the long trip from California. The same applied to Page Golsan and Herb Calvin, both of whom live in Laguna, Calif. ... Harold Mabbott is in good health but could not come due to his daughter's visit from Missouri. . . . News was received of the sudden passing of Ralph M. Ferry on May 23, 1967, at St. Michaels, Md. where he had retired after 43 years with Alcoa having served as manager of the Edgewater, Pittsburgh and Alcoa plants. A letter of sympathy was sent to his wife, Hannah. Ralph was a fellow of the A.S.M.E. and a life member of YMCA, as well as of the Industrial Management Club of Allegheny Valley, and was one of the founders of the Chesapeake Bay Maritime Museum. . . . Kenneth Barnard advises us of the birth of his 6th great grandchild. We wonder if anyone can match that record. . . . A letter from Bates Torrey tells of visits from the Pratts and the Mitchells on their return trips from the Reunion. The Torreys formerly attended all the Reunions but have not been able to do so lately due to Alice's

poor health. Thank you for your note, Bates! Best wishes. . . . Your new scribe is still keeping occupied with his covered bridge hobby. Helen and I have now visited about 1100, practically all of those still standing in this country. This has resulted in writing many articles for papers and magazines as well as a busy lecture program. We are presently preparing a book on covered bridge trusses and had planned a visit to some 100 structures in Austria, Germany and Switzerland this summer, but were obliged to cancel at the last moment due to a brief illness. Many of you have requested more Class news. This first attempt has not been difficult, but if it is to continue, we must have the support of every Class member. Please make a special effort to send in an article, maybe a brief biography or a write-up of a hobby or perhaps of a recent trip. Write to me or to Jay Pratt and tell us what you have been doing.-Ray E. Wilson, Secretary, 304 Park Ave., Swarthmore, Pa. 19081; Jay V. Pratt, 937 Fair Oaks Ave., Oak Park, III. 60302

13

Welcome boys and girls to another year of glory. Next June will usher in the 55th Reunion of the Class of 1913 from the portals of M.I.T. Are you planning to join us on that momentous occasion? We were notified in the latter days of May by Dick Knowlton, Manager of the Oyster Harbors Club, that the Board of Governors had decided not to entertain any class reunions, business conferences, etc., after June and September of 1967. Your Secretary immediately phoned your President, Charles Thompson, and following a huddle it was decided to communicate with Mrs. Hilda H. Coppage, Manager of the New Coonamessett Inn at Falmouth on the Cape. Many of us spent a very rewarding Reunion in 1956 in the Dutch cottages. We have made arrangements to reunion there in 1968 on June 7, 8 and 9th. So start making plans to celebrate our 55th Anniversary. The Technology Review management forwards short messages of some of Classmates from time to time as: Walter L. Whitehead writes, "Just out of hospital after a six-months illness.' We hope that you are again enjoying good health. . . . William F. Herbert writes, "Well, here I am from now on at the Strawberry Ck. Lodge (rest home), Berkeley, near the famous U.C. campus, but it doesn't rate with good Old Tech on Boylston St., Greetings to all from '13. It appears to be a long, hot summer here." . . . We notice that our classmate Allison Butts, Professor Emeritus of Metallurgy and Materials Sciences at Leigh University, has published a new book, Silver: Economics, Metallurgy and Use. This book is a 488-page treatise with 200 illustrations. We of the Class of 1913 are very proud of you Allison. Professor Butts, retired from active teaching in 1957 after more than 40 years on the Lehigh faculty, has received many honors and awards in recognition of his scientific and educational contributions as: He was elected in February a member

of the Legion of Honor of the American Institute of Mining, Metallurgical and Petroleum Engineers (AIME) after 50 years of continuous membership; in 1959 he was honored by the AIME and presented the AIME Mineral Industry Education Award. In 1955 he received the Leigh Valley Chapter of ASM Stoughton Award. In 1961 he was selected by the American Society for Metals and presented the Albert E. White Distinguished Teacher Award. Good work, Al. Keep busy. That is how we keep young.

Notices have been received from the Alumni Office that two of our classmates have gone to their Maker: Frank T. Smith, 865 Veterans of Foreign Wars Parkway, passed on April 11, 1967, and R. B. McCarthy of 4417 North Frederick Avenue, Shorewood, Wis., 053211, reported that his father Charles J. McCarthy died on August 7, 1967. For the Class of 1913 we are forwarding cards of sympathy to both the Smith and the McCarthy families. It is with a very sad and heavy heart that we must report the death of one of our adopted sisters. Charlie Brown's dearly beloved wife Helen passed away on June 2, 1967, after a long struggle. Charlie gave her the most constant and loving care that any man could for his dear wife. We have written to Charlie, and we not only offer our sympathy but high praise and hope that he will find solace in his latest endeavors in the Grand Canyon. Many thanks to Herb Shaw for advising us of Helen's death. Hope you and your dear wife Leila enjoyed your sojourn on the Cape, and it was certainly an enjoyable trip to the West Coast, out by plane and back by train. The Capen family missed the Alumni Day in June at M.I.T. due to a slight illness of your Scribe, but through the kindness of Warren and his Mrs. Glancy as well as Charles Thompson, we learned that several of our regulars showed up for the luncheon or dinner or both, the Glancys, Burt Cushing, Gene MacDonald, Walt Muther, Charlotte Sage, Phil Terry, and last but not least Charles Thompson. The next Alumni Day will be our 55th. Let's go. . . . Our heartfelt sympathy goes to Jack Farwell who is mourning the loss of his dear sister, Rachel Wheeler. ... Ethel and Gordon Howie have moved again to 1221 Drew St., Apt. B 13, Clearwater, Fla. 33516. Gordon writes: "This is to show that old timers like me have given up lawn cutting and have moved into a cooperative apartment.' Guess it is cheaper to move than pay

We believe that the Alumni Association should be complimented especially, Don Severance, for the thoughtfulness in sending a program to the next of kin of the Memorial Service for M.I.T. Alumni who have passed on in the past year. It is with deep regret that Charles Thompson and your Secretary will be unable to attend the National M.I.T. Alumni Officers Conference, September 29 & 30, 1967. We have not heard from Bill Brewster or Eugene Macdonald as to their plans. This civil defense project is very varied and time-consuming with its many phases

of endeavor. We have suggested that the Alumni Office invite some of our classmates on the Pacific Coast to represent us Eastern officers. We wrote to William Mattson urging him to participate in the festivities of the Conference. Bill for many personal reasons cannot make it. He was in Boston for the last week in May attending a reunion of his Co.E 101st Engineers as he was the captain of that company during World War I. The Capens and Charles Thompson had dinner with Bill one evening, and we all enjoyed his visit immensely, like old times. We received an announcement from Mrs. F. Imogene Bonney that she has come East and is living at the Woodland Park Apartments, 270 Grove Street, Apt 6, Auburndale, Mass. 02166. We know that Gene will be pleased to hear from any of Bob's former classmates or their mates. Well, that's it for now. Look for our Christmas notes.-George Philip Capen, Secretary and Treasurer, 60 Everett Street, Canton, Mass. 02021

14

Well Alumni Day 1967 has passed with the usual corporal's guard present, except for your Secretary who was temporarily indisposed. The records show Tom and Louise Callahan, Dinny and Lois Chatfield, Ray Dinsmore, Freeland Leslie, Harold and Florence Richmond, Leicester and Alma Hamilton and Harold Wilkins dining together and spending most of their time there. . . . Howard Stone, Course I, died. He spent most of his life practicing his profession in Connecticut, much of the time with the firm of Hunter and Havens of Bridgeport. He married Helen Haners in 1917, and there were three children; one boy is deceased. The Class extends sympathy to Mrs. Stone and the children. . . . Gerald H. Beard passed away on August 17, 1967. Until his retirement in 1958 he had been President of the Northwestern Construction Company. He had been in failing health for some time. In reporting Gerald's death in a letter to Dinny Mrs. Beard notes that they met while he was at Tech and she attended the New England Conservatory of Music. Somehow that makes the romance seem a bit more homey than usual. They had been married for 52 years. It seems likely that there are several in the Class who have known both Mrs. Beard as well as Gerry. Our sincere sympathy to Mrs. Gerry Beard.

A specially well-known member of our Class also died recently. His history is well summarized in the following clipping from the Philadelphia Inquirer of July 6, 1967. "Retired P.E. official, George E. Whitwell, retired Vice President of Philadelphia Electric Company and a past President of the Philadelphia Chamber of Commerce, died Wednesday. He was 75 and lived in the Thomas Wynne Apartments, Wynnewood. After graduating from M.I.T. in 1914 Mr. Whitwell worked for a number of utility companies. He joined P.E. in 1931 as Vice President in charge of the sales department and held that position until

his retirement in 1956. During the First World War Mr. Whitwell served in the photographic section of the U.S. Aviation Corps. Afterwards he taught chemical engineering at the Univeristy of Washington in Seattle. During his teaching stint he developed an improved and patented process of carbureted water gas which received much usage by the gas industry. In 1933 he originated the National Better Light-Better Sight movement, which is still operating under the auspices of the Edison Electric Institute. As a result he was given the James H. McGraw Award in 1935 for cooperation in the advancement of the electrical industry. He was a past Director of the Chamber of Commerce of the United States; a past regional Vice President of the National Association of Manufacturers; a past Director and member of the Executive Committee of the old Liberty Real Estate Bank and Trust Company, past Chairman of the Board of Directors of the Quaker City Federal Savings and Loan Association. He was also a past trustee of the Bureau of Municipal Research, Trustee and past President of the Northern Home for Children, Honorary Chairman of Junior Achievement of Philadelphia Metropolitan Area, Inc., a member of the Philadelphia Country Club and the Midday Club. Mr. Whitwell had also been active with the Philadelphia Council of Girl Scouts. He was a member of Phi Lambda Upsilon, Surviving are his wife, the former Ruth McCallum; two daughters, Mrs. Robert F. Gilkeson and Mrs. H. J. Bartle, 3d, and a son, Sanford.'

Gilbert A. Wagner, Course VI, who spent three years with our Class, died in July 1967. He lived at 61A Hydeville St., Stafford, Conn. Our records indicate that he practiced as an electrical contractor in the Stafford Springs area during his active professional life. He married Lulu Irene Ide in 1916, and she died in 1957. There were three children to whom the Class extends its sympathy. . . . Gossip column: The Charlie Fiskes en route to Florida early in October stopped off in Hartford to lunch with the Dinny Chatfields. The Lin Faunces summering in Maine paid a visit to the Affels in Rome, (Maine). Vi and Ray Dinsmore were still at their Winter Haven, Maine, place in mid-September. Ray tells us that he is now making a good recovery from his attack of shingles, which was complicated not too long ago by a bout with the flu. . . . Florence and Harold Richmond have completed a two-month Carribean and South American trip which included Haiti, the Panama Canal and Valparaiso, Chili.-Herman A. Affel, Secretary, Rome, Maine. Mail: RFD 2, Oakland, Maine 04963

15

Hello everybody! Here beginneth the first column of the new season with the hope you and your families have all enjoyed a pleasant and happy summer. Our congratulations to that fine 1917 Class for the great job they did on their

50th Reunion and their splendid contribution to M.I.T. It was a pleasure to work with Brick Dunning on their Reunion Directory. Many thanks to them for the attractive copy they sent me. Attending Alumni Day activities at M.I.T. on June 12 were Larry Bailey, Whit Brown, Evers Burtner, Jack Dalton, Henry and Mrs. Leeb, Bob and Mrs. Mitchell, Archie Morrison, Wally and Mrs. Pike and daughter Marion, Pirate Rooney, Bill Smith and sister Charlotte, Barbara Thomas, Fred and Mrs. Waters, Pop Wood and his niece. These, with enough others to total 60, attended our annual Class cocktail party that afternoon at the Faculty Club. About half this crowd stayed at the Faculty Club for a delightful Class dinner. Then on for cordials to Bill Smith's lovely 19 deck apartment in downtown Boston, where his gracious sister, Mrs. Charlotte Swett from Fall River, conducted her Class guests across the "Bridgeway to the Stars" which the Admiral had designed from his Course I training. Everyone reported a spectacular, happy and exciting evening for a friendly group of classmates and guests. Many thanks to our hostess and host. And our profound appreciation to Al Sampson who again voluntarily and generously underwrote the deficit, beyond our nominal charge for the dinner. Again Al and Barbara put on a memorable show for our own cocktail party and dinner and finale at Bill's. Many sent regrets. We missed them all: Allen Abrams at a Washington & Jefferson meeting; Phil Alger recovering from surgery; Maurice Brandt; Frank Boynton; Ken Boynton; Orton Camp attending his 55th at Yale; Ellis Ellicott; Reggie Foster visiting his grandson in St. Louis; Boots Malone scheduled for surgery; Harry and Lucy Murphy attending a family wedding in Quebec; Margaret Runels; Bill Spencer attending grandchildren graduations; Bill Tallman; Max and Catherine Woythaler who sent a card from Norway where they were on a North Cape cruise enjoying the midnight sun and scotch @ 40¢ and Heinikin's at 23¢. And who else missed the day's celebration and partying? The Macks themselves. I was laid up at home with a combination of chills and fevers (104°) which Dr. Jim Tobey described as "Schistosomiasis." I don't know what that means, but I do know I felt just about as it sounds. Fran, my nurse, had many phone calls during that night and the days following.

After the tough time Henry Daley had with his surgery last spring, it was wonderful to have him and Frances here for our Class cocktail party and dinner. He wrote: "It was sad to learn of the passing so recently of Johnnie O'Brien and Alan Dana. I knew John well in our student days and remember particularly his football ability. We are just losing the boys too fast lately but have to face the fact that the mean age of our group now is approaching 75. All the more reason to take care of ourselves more than ever. I take courage and inspiration from a letter I received recently from James Driscoll, Secretary Class of '96, who is still going strong and is proud that there are still 17 survivors of his class. Their mean age must be at least 93. Something for our gang to shoot for." At a dinner in Washington recently. Virginia (Thomas) Johnston met Mary Rice, and they had a fine old talk about 1915 people and affairs. . . . Now news from good old classmates widely scattered. Doug Baker, East Middlebury, Vt.: "Since my recent surgery I have more leisure time than formerly. On two mornings a week I go to the town clerk's office in order that the books may be audited currently as far as possible and to start preparation of the statistics that go into the town report. Other days I usually get in a couple of hours of light work such as rototilling the garden, equipment repairs, etc., but major projects have been put aside. Quite a change from my former schedule! The summer visits of distant branches of the family are over for this year; the principal one was by our son John and his family from Pasadena. This overlapped other visits, making for a real family reunion. It was hectic but enjoyable for everyone."

Archie Morrison was up to see Doug and Elizabeth during the summer. . . . Wally Pike sent a clip from the June Consulting Engineer telling about Bill Holway and his family: "Pretty Marcia Holway, 22, brings computer technology to Holway Engineers as she becomes the third generation of Holways to go into active service in the 47-year-old consulting engineering firm in Tulsa, Okla. Marcia is using her professional talents in a variety of Holway Engineers projects, including a major segment of a new turnpike in eastern Oklahoma. She holds a B.S. degree from Washington University, St. Louis, Mo., in applied mathematics and computer sciences. Much of her work for her father, W. N. Holway, founder and chief principal, centers around her grasp of computing techniques." . . . Ben Hurvitz writes: "My oldest son is an Assistant Professor of Far East Languages. He majored in Greek and Latin and is well versed in French, German and Hebrew (Biblical and modern). My middle son is an office manager for I.B.M., and my youngest son owns and operates a travel agency in Boston." . . We were all delighted to see Hank Marion but surely missed Virginia who could not come up to the Class party. Hank wrote: "I hope you have had a good winter and are feeling in the pink. Virginia and I are fine. We had a wonderful winter in Tucson and are all fine. Virginia joins me in wishing you the best. Give my regards to the boys.

Bill Mellema: "I have been retired since 1960 but still keep my license so that in a national emergency I may be able to resume my practice as an architect and structural engineer. A local doctor decided I had a bad case of diabetes and that I needed a lot of exercise. So I guit and remodeled my beach house. It turned out that the doctor was wrong and I have only a tendency towards diabetes, and with sugarless diet and lots of pills I'm doing all right. But Mrs. Mellema has been seriously ill. In May 1966 I was invited by the Structural Engineers Association of Southern California, along with three other charter members, as a

special guest. I was one of 12, often referred to as the 'Dirty Dozen' who founded this organization, which today has over 900 members. I have always wanted to pay a proper tribute to the public school teachers of the United States and this was my golden opportunity. Well, to my utter amazement when I finished, I received a standing ovation. The Secretary told me that in the entire history of the Association no ordinary member had ever received a standing ovation, only prominent speakers. In my speech I failed to mention that I took a course in architectural history and one in economics at the University of Pennsylvania in the summer of 1915 in order that I might have no extra courses to take during my graduate year. In this day and age I feel frankly sorry for those architects that have not had a thorough training in structural engineering. They are totally at the mercy of their structural engineers, and some, as noted in the warning letters from the A.I.A. sent to all us members, have had to pay huge damages for the mistakes made by their consultants whose work they were unable to understand and check. I think M.I.T. should pioneer a sevenyear course in architecture that would force all prospective architects to become thoroughly trained in structural engineering, and thoroughly understand mechanical and electrical engineering. It is tough, Azel, to get old!" In his speech, a copy of which he sent me, Bill goes back to his birth in the Province of Friesland in the Netherlands, his early life at home and in school and in his father's business of building construction until he went to this country in 1907. He worked for a Dutch contractor and went to evening school for foreign students. Because of his aptitude and his desire and ability to learn, his teachers took a special interest in him, encouraged and helped him through an intensive high school course and finally to pass the college entrance exams of the times. He went a year to Amherst, then joined our Class and finally received an M.S. in architecture in 1916. In 1920 he went to California and has been successful out there ever since. Some of the early experiences he describes in new and radical concrete arch construction would excite you Course I and IV fellows.

Bob Mitchell: "I have no duties or definite obligations of time, but I have more trouble now keeping up with my mail than I did when I was holding down a job. Probable reason, no secretary. And we travel quite a bit. As a retiree I help instruct and guide my grandchildren in some of the things they don't learn in school, such as how to race a sailboat, hit a bird on the wing, or take a trout with a fly. And a couple of them who are too sports-minded I have to work on to keep their grades up so they can enter college. I'm finished with business, and otherwise garden well, golf poorly, fish a bit, and I still enjoy taking a boat 'to weather' in a breeze, against competition; this is still my big thrill. Both my sons-in-law race (in sail) and I still get some good sailing." I remember

Bob as a young "salt" when he used to take me sailing in undergraduate days in Boston harbor. . . . It's nice to have such a warm letter from Margaret Runels in Lowell. She wrote to Al: "How thoughtful of you to invite me to the Class festivities on June 12. 1915 meant so much to Chester that I do want to carry on the friendships. I would like very much to attend the cocktail party, and will surely do so unless I am away at the time. My plans are a little uncertain. Ralph, Chester's brother, was pleased to attend your recent '15 dinner and to meet so many of the friends whom Chester had spoken of so often. 15's Class spirit and loyal friendships are truly remarkable, and I shall always be happy to be associated with them." Ralph Runels, Chet's brother, wrote after attending our May 10 Class dinner in Cambridge. He'll always be a welcome guest. "I want to thank you and your classmates again for the very wonderful evening you gave me last week. The older we grow the more we realize that friendship is about the biggest thing in life, and I am very proud to be an honorary member of my brother's Class of 1915. I am afraid I will have to pass up your kind invitation for cocktails on June 12 as my plans are wholly indeterminate. I would like if possible to attend 1911 Class activity this year but am extremely doubtful if I will be able to make it. I reported to Mrs. Chester Runels the wonderful time I had with you, and she asked me to give all the boys her regards should I contact you which I am most happy to do. Thanking you again, Azel, and hoping you or any of your classmates would drop in to see me when in Lowell. Kindest personal regards."

Margaret and Ray Stringfield spent part of the summer among the famous redwoods in California. Ray wrote there was nothing to do but sleep, eat and read Perry Masons. It was too relaxing to work. Ah, me!. . . Molly Swift sent a full page clip from the July 31 Concord (N.H.) Daily Monitor which says in part, "A milestone was reached Thursday when the New London Historical Society held open house at its Old New London Restoration. The project was given timely interest by the gift of a period house from Mrs. Herbert D. Swift. The Griffin Barn, third unit of the Old New London project, now stands on Old Main Street. It will be dismantled, moved and rebuilt on its new site when sufficient funds are available. Mrs. William F. Kidder, Treasurer of the Herbert D. Swift Memorial Fund, reports that more than \$1,000 has been donated to the moving and restoration of the barn in tribute to Swift, an engineer with great interest in the early farm life and husband of Maude Fellows Swift, first president of the Historical Society when it was founded in 1954. This barn will house tools, farm implements and vehicles depicting the agricultural - artisan occupation of the early citizens of Old New London." This is a fine tribute to Speed for his high standing in the community and the many generous contributions he made for the benefit of town.

Jim Tobey has given up his winter suffering on the Florida Gold Coast for the comfort of his tree shaded country place in Newton, Conn., where he had to struggle through a hot and humid summer. He wrote, "I hope you are having a pleasant Memorial Day on Memorial Drive with no air pollution. [He should know the miserable conditions here in Cambridge]. Since our return from sunny, more or less, Florida the New England weather has been odoriferous except for two or three good days." Too bad for Jim! . . . Fran and I have enjoyed some pleasant and interesting visits with many of our classmates and their families in and around Boston. It's always friendly to be with them. The Class of 1916 suffered a sad loss in the tragic death of Steve Brophy who was killed in an auto accident in Pawling, N.Y. on June 29. . . . Augustine J. Caffrey died in Lawrence, Mass., on June 29; Alfred V. Coleman died in Weymouth, Mass., on August 22. The sympathy of our Class has been expressed to the families of these two men. Next month's column will contain play-by-play details of the Class dinner held at Cambridge September 22. This uses up all the material, notes and news collected during the summer, so help Azel.-Azel W. Mack, Secretary, 100 Memorial Drive, Cambridge, Mass. 02142

16

We are very sorry indeed that we have to report the tragic death of Thomas D'Arcy Brophy on July 29 in Pawling, N. Y. Steve and Jess were enjoying having their daughter, Mrs. Thomas B. Tyree, and grandsons Thomas, 6, and Billy, 5, with them at their country home in Quaker Hill, Pawling, while their son-inlaw, Major Tyree, was in Vietnam. It was after breakfast and Steve and his two grandsons were on a happy shopping expedition and had just bought fishing gear for the boys to use in that charming little lake that borders on the Brophy place. Steve had parked his car on an incline at the supermarket, walked toward the store leaving the boys in the car, looked back and saw the car starting to roll slowly backward. He rushed back, and in trying to stop the rolling car was crushed between it and a parked truck. He died in an ambulance on the way to the hospital in Poughkeepsie. We have more to say, but before giving our story of Steve and his career, let us tell of our 51st Reunion last June in which Steve and Jess took their usual active part.

The Reunion was held in Chatham Bars Inn in Chatham on Cape Cod where we have had so many delightful reunions before. This time we had the pleasure of celebrating with our close young neighbors, the Class of '17, who were out in full force for their big 50th. And it was a sparkling occasion with all members of both classes in bright red blazers, the kind that drew favorable M.I.T. and public comment all over Cambridge and Boston a year ago at our 50th. We had a total of 44 from '16 this year at the combined events on the Cape from Thursday through Sunday and on Alumni Day,

Monday, in Cambridge. Here is a list of those who attended: the Joe Barkers, the Steve Brophys, Jack Burbank, the Harold Dodges, the Bert Ellises, Jim Evans, the Ralph Fletchers, Gonzalo Garita, (from Mexico), the John Gores, the Cy Guethings, Dick Hunneman, the Emory Kemps, the Charlie Lawrances and son Dick, the Gene Lucases, the Mac McCarthys, Shatswell Ober, Bob O'Brien (honorary member), Dave Patten, the Charlie Reeds, the Henry Shepards, the Francis Sterns, the Peb Stones, the Hy Ullians, and the Don Websters.

And here are a number of items that run through our minds as we recall all the pleasant moments, associations, and wafts of sun-drenched salty breezes: the delicious clams and lobsters at the good old New England clambake on the water's edge; the big 1916 banner over the entrance to Cottage G where all the clan gathered except at nap time; the chattering of the advance group that got there a day ahead of time and really relaxed; someone saying the robins on Cape Cod sound just the same as the ones in Washington; Steve Brophy playing the friendly breakfast table photographer with a see-the-birdie-now Polaroid; the big Saturday night banquet with President Howard Johnson dropping in to greet us and with the excellent wine furnished as usual by prexy Ralph Fletcher; Ralph, speaking at the '17 banquet, pointing out he was originally a '17 man for he was marginally too young to enter Tech but was allowed to come in if he would relate to '17 for a 5-year stretch. But instead of being a drop-out from '17 he was a drop-up to '16, and "very glad to get out in four years"; the Sterns and the Stones in friendly combat at the afternoon bridge table; the Johnny Gores, new regulars with two reunions in a row; the Emory Kemps on their annual reunion-trek to the Cape which they used to own a part of; the clear blue sky for four days and the radio telling of terrific heat back home; walking on the sandy beach, such as the barefoot meanderings of Millie and Charlie Reed and the early morning before breakfast wanderings of Cy Guething and Harold Dodge; discussions with Frieda and Hy Ullian about education and where it is going; Cottage G, the '16 gathering spot for many many reunions and the bulletin-board display of published 1916 happenings for the past year; the album of colored pictures of the 50th Reunion (contributors:

Kay and Irv McDaniel, '16, with his mother, Mrs. Josephine McDaniel, cut the cake at their July golden wedding anniversary.



Willard Brown, Herb Mendelson, Bob Burnap, Phil Baker, Walt Binger, Jim Evans, George Maverick, Earls Pearson, Francis Stern, Peb Stone, Vert Young and, Melvin Howard, photographer of Hyannis) and the framed assembly of pictures of '16 executive committee members prepared by Jim Evans and presented to Ralph; the colored slides of the 50th furnished by official 50th photographer, Willard Brown, and Herb Mendelson; the heroic efforts of your Secretary and your new Assistant Secretary trying to give a colored slide show, using a projector with an ingenious (Sibyl-furnished) putty knife for pushing the slides into the right place, and the unappreciative merriment when slides showed upside down or sideways and the cheers when one slide happened to show right side up (and not backwards, reading T. I. M. instead of M. I. T.); some of the old tales of '16ers when they were young, such as the one about you-know-who at the time of the Jack Sharkey fight, who bought the horse from the cabby in Central Park, took it into the lobby of the hotel with him and tried to take the horse up the elevator (not clear whether he succeeded), and how the cabby cried; the story about two jumper suits or jump dresses or "apres ski" wear, bought in a Chatham sports-wear store by Sibyl Fletcher and Betty McCarthy-too big a bargain to pass up, reduced from \$50 to \$15, one in beige, orange and yellow burlap and the other in shocking pink jersey-and much discussion on where they could be worn (one suggestion, at the 52nd; this is a formal request); Cy Guething telling about the time he received a birthday cake from Jim Evans, collect; and Cy the gardener's experience with Hav-A-Heart traps for catching squirrels-he got only cats; Bob O'Brien, the arranger, one of the secret ingredients of wonderful every-year reunions; the story Millie Reed told about the book club in Washington and what the book store man told her when she gave him the list of new exciting books the club wanted; the hint that Ralph's "toy of the year" this year is a houseboat 2nd hand, bought on the Mississippi near St. Paul to be delivered and reassembled in Quebec, that will accommodate 30 sitting down, and all the free advice handed out about what to do with it.

While it was mostly fun and merriment, there were a few bits of serious doings at the Reunion. With the passing of Bill Barrett there was need to fill the post of Class Agent. Joe Barker agreed to handle this position under a system of active support of some 10 to 15 classmates whereby each member of the Class will be approached by one person only, a classmate, for participation in the Alumni Fund. The resignation of Hovey Freeman as Treasurer was accepted with regret-a position that he has handled faithfully and diligently for many years. Francis Stern was chosen as the new Treasurer of the Class. We know our money will be safe and sound with Francis. too. And Peb Stone, regular and enthusiastic reunioner, and preparer of the identifying lists of the two 50th Reunion class pictures (no easy job), is our



Two new Class officers of '16, Peb Stone (left), Assistant Secretary, and Francis Seun (right), Treasurer, enjoy the 51st Reunion with Secretary Harold Dodge.

new Assistant Secretary. So from now on if you seem to be bothered by two sources asking for news and bits of philosophy, you will understand why. And if you want to know how he came to be called Peb, and what relation it has to Stone, just figure it out or ask him (Sec.).

And now to return to Steve Brophy, without repeating too much of what is given about him in the Institute Gazette in the earlier pages of this issue of the Review. It is hard to write a good enough story about Steve. From the day he entered M. I. T. in 1912 his warm personality endeared him to all of us. He became a leader in every activity of the Class and of the entire student body, culminating in his being the student chairman of the great pageant which marked the move in 1916 of Boston Tech across the Charles River. Fittingly, the Class marked its 50th Reunion in 1966 by re-enacting that voyage of the Bucentaur at the alumni luncheon, and again it was Steve who chaired our 50th Reunion Committee. He was in fact Chairman of all 10 of our 5-year reunions, from 1921 to 1966. He and his charming wife Jess were among the most faithful attendants at our yearly reunions and always were to be found in the center of every gathering. As Joe Barker has expressed it, something precious to each of us has been lost in his passing. Throughout his very successful business

career, Steve gave unsparingly of his time and his executive ability to a multitude of civic service activities, and entered wholeheartedly into every movement to enhance M. I. T.'s position in science and engineering. He became a Term Member of the M. I. T. Corporation in 1948 and a Life Member in 1953. Jim Killian's letter to the faculty told of Steve's imaginative contributions to the work of the Corporation, and of his brilliant career and public service activities. He served, for example, as a member or chairman of eight widely different M.I.T. Visiting Committees-the list would amaze you! During World War I! he served as an artillery instructor and rose to major before his discharge in 1919. He was with the South Atlantic Maritime Corporation, then a Vice President with Anaconda before going with Kenyon and Eckhardt, N. Y. advertising firm, in 1931, where he became one of the most respected executives in American advertising. He was elected President of Kenyon and Eckhardt in 1937, Chairman of the Board in 1949, and retired

in 1957. He was founder-director of the Advertising Council and Chairman of the Board of the American Association of Advertising Agencies for 1948-49.

Steve never talked about the many honors he received, and we just didn't know about some of them. He was a founder of U.S.O. at the start of World War II, and was a director of the National War Fund from 1943 to 1945. In 1947 he became an honorary commander of the Order of the British Empire. One thing many of us bragged about was that Steve, as President of the American Heritage Foundation (he was still President in 1967), headed the publicizing of the Freedom Train which visited many cities with its 150 documents of American history. And only now we know that, as a result, he was given the Good Citizenship Award of the Sons of the American Revolution. Another continuing activity was his chairmanship of the Society for the Rehabilitation of the Facially Disfigured. He was vitally interested in the progress being made in reconstructive plastic surgery, and was closely associated with Dr. John Marquis Converse's work in this field. He was an active director and member of several societies and organizations dealing with the crippled, the handicapped, and the disabled. And just this past June, we hardly need to ask who you think made the official presentation of the Silver Stein Award to Julius Stratton, '23, at the Fellows dinner and dance of the M. I. T. Alumni Center of New York. It was our Steve, the recipient of the award himself in 1958, an award for distinguished service to M.I.T. Steve is survived by his widow, the former Jessie Stewart Milligan, and two daughters, Mrs. John L. Cleveland, Jr., and Mrs. Thomas B. Tyree. At the funeral services in New York, the honorary pallbearers included President Howard Johnson of M.I.T. and Jim Killian '26, Chairman of the M.I.T. Corporation. We wish to offer the sincere sympathy of all of the officers and of the entire Class of 1916 to his dear Jess and family. To this we add the warm expressions of sympathy received from our two neighbor classes, 1915 and 1917, through their faithful secretaries, Azel Mack and Dix Proctor.

We have on hand two copies of page 3 of the July 31 Boston Herald Traveler with a picture of Doug Robertson in an article entitled "Private Fliers Gather at Worcester-128 Pilots Attend Refresher." One of the clippings was sent by Nat Warshaw and the other by Fannie and Jeff Gfroerer who wrote, "Henry Shepard sent us the enclosed clipping about Doug Robertson and suggested it be sent to you for your Class notes -I'm sure you welcome unsolicited items!" Truly yes! The article starts: "It was a long weekend—just right for cramming for the 128 pilots who attended a three-day flight training clinic here. Sponsored jointly by Atlantic Aviation and the Airplane Owners and Pilots Association, pilots from as far away as Florida and the Carolinas flew in for the refresher course. At the height of the classroom and actual flying courses

87 privately-owned aircraft were tied down at the municipal airport here." And the picture carries the caption: "Never too old, J. D. Robertson, 72, of Taunton gets instruction in the use of the letdown chart from Hank Masek of Florence, S. C." And one of the clippings has a hand-drawn arrow pointing to Doug's head with the notation, "How does he keep his hair?" . . . Bill Leach says, "It was quite a shock," but he has been elected a fellow of the American Association for the Advancement for Science. In June he told of the in-progress work of installing an elevator at home in Austin "since we are not getting any younger." He said he and Helen were going North in the middle of June to their place in Youngstown, N.Y., which they are giving up to "get what we want to bring to Texas from the farm. It will be a relief not to have to go North every summer and take care of the farm. No one wants to work since we are all getting

educated." It is hard to keep track of Rudi Gruber who couldn't make the Reunion because of an extended visit in Germany, but from Lindau, July 21, we had this word: "Received your sad message of Bob Crosby's passing on my return from a visit to Kenya and Tanzania, East Africa. There were no unpleasant incidents in these two 'Black Republics.' Weather was most pleasant and natives very friendly. Also saw a great deal of wild life on safari. Will be back in Colonia mid-August and hope the 'Jersey Rebellion' will have quieted down by that time!" Sylvia and Vertrees Young together with Art Shuey made up three out of a party of four that took an extensive South American trip by sea, by air and by sea again. They started in New Orleans aboard the Gulf Farmer of the Gulf-South American Steamship Company, had stops in Ecuador, Peru, and Chile, flew from Valparaiso to Buenos Aires, and finished with a long return voyage on the S. S. Nopal Rex, Norwegian freighter with stops in Brazil and Venezuela. Again Sylvia has prepared an account of their travels, her 4th Young safari in fact, and we will have the opportunity in later issues to give some more samples of her beautiful writing, descriptive gems about people and places in out-of-theway spots in South America. . . . We haven't checked yet to see where Vi and Herb Mendelson were traveling this past summer. But we did get an oversized card from Kenmore Village in Scotland late in August from Ralph Fletcher, with the message: "Sibyl and I are here for a few days grouse shootting. Have had eight days of sun which is almost impossible in Scotland. This is a delightful inn on the river Tay. Our best." . . . The Irv McDaniels got back safely and whole from their trip to the Orient but not in time for the 51st. And as some know, they had a wonderful Golden Wedding party with sword cake-cutting ceremonies early in July in Newport Beach, Calif. A very special feature is reported in the local paper: "When Captain and Mrs. Irving McDaniel of Newport Beach celebrated their 50th wedding anniversary Friday, they had a very special guest with them for the

festivities—his mother, Mrs. Josephine McDaniel. The elder Mrs. McDaniel is an alert, active woman whose looks belie her 94 years. She has lived with her son and daughter-in-law since they made their home in Westcliff Villa four years ago." We will have more to say about their travels in later issues. . . And Ralph Davies has moved from Pittsburgh back to Massachusetts, at 10 Fremont Street, in Dartmouth.

We regret to report the passing on May 20 of another of our regular reunioners, Harold Gray, of Fayetteville, N. Y. As Adele has written, he had had much pleasure over the past year wearing his 50th red blazer on occasions and had been looking forward to wearing it again in June at the 51st. He seemed in good health when they returned from the Cloister at Sea Island ten days before the heart attack that took him so quickly. We know he was very proud of his company and its product-high quality precision castings. In his 50th biographical notes he wrote that this is what gave him the greatest satisfaction: "Seeing my own business grow and having a son who is taking over and doing better than I did." His extracurricular activities were "dry fly fishing, average quality golf, and foreign travel." From an up-state newspaper we read: "Harold P. Gray, 72, of S. Gate Road Fayetteville, died Saturday night at his home. A native of Dorchester, Mass., he was the founder of Gray Syracuse Inc., Manlius. He was a past President and at the time of his death was Treasurer of the company. He graduated from the Massachusetts Institute of Technology in 1916 where he was a member of Kappa Sigma social fraternity. He was a member and past president of the Onondaga Golf and Country Club, a member of the Century Club, member and former director of the Manufacturers Association and a former member of the Syracuse University Club. Surviving are his wife, Adele Emery Gray; a daughter, Mrs. Elizabeth Stevens of Fayetteville; a son, Richard E. Gray of DeWitt; a sister, Mrs. Kenneth Sherman of South Newbury, N. H.; three grandchildren." . . . Wè also regret to report the passing of another regular reunioner, Bob Crosby, on June 2 and of Fred Bryant on June 21, and will have more information in a later report.

The New York monthly Class luncheons started again on September 5 and are now joint luncheons of the classes of 1916 and 1917. The men of '16 present were Barker, Caldwell, Dodge, Evans, Fairfield, Gruber, McCarthy and Stern, and from '17, Hunter, Loengard, Proctor and Sullivan. We suggest you plan your next trip to New York to coincide with one of the monthly luncheons, held at noon at the Chemists' Club, 52 East 41 St., on the Tuesday following the first Monday of each month. And before closing let us note that the lists of names of those in the two 50th Reunion pictures were nearly completed at the 51st in June. Copies of the nearly-complete lists may be had by writing to your Assistant Secretary. We still need a ilttle

help to identify the following: first, in the color photo in the Great Court, Cambridge, the man between Stew Rowlett and Phil Baker, in front of Vert Young and behind John Gore. Second, in the Oyster Harbors Club black and white picture, three ladies: (1) 2nd row, seated, 5th from the left, between Edith Pearson and Hazel Crosby; (2) 2nd row, seated, 5th from the right, between Fran Hoffman and Frances Lovenberg; (3) balcony, seated, 7th from the left, between Jessie Evans and Pearl Wilson; and one man, (4) 3rd row, standing, 14th from the left, between Stew Rowlett and Jap Carr. If you can identify any of these, please let us know. . . . So, once again we say, but this time with two voices, write a little but write often a bit of news, a bit of fun, a bit of philosophy to keep the column full and interesting. - Harold F. Dodge, Secretary, 96 Briarcliff Road, Mountain Lakes, N. J. 07046; Leonard Stone, Assistant Secretary, 34-16 85th Street, Jackson Heights, N. Y. 11372

17

Al Lunn, our re-elected President, comments for the new and initial volume of the Review as follows: "Our hard working Secretary has asked me to write an opening paragraph for these notes, and as you know he is a pretty stern task-master so I cannot very well refuse. As we look back to our 45th Reunion at Snow Inn, we recall that it was an excellent party, but since we were competing with the class of 1912 at it's 50th, we had some problems with accommodations and food. Nevertheless, it was a fine affair, and as we take that backward look we think of those loyal members who attended and are no longer with us, or who were unable to attend our 50th. We determined to organize our 50th so that we could avoid some of the problems, and accordingly and immediately appointed Tubby Strout to head our Hotel Accommodations Committee. Tubby did a superb job, to which I know you will agree. Our other committees were appointed promptly and all did their jobs flawlessly. Between 1962 and 1967 we had four interim reunions. Unfortunately these were attended principally by classmates along the Atlantic seaboard and New England with very few from the Midwest or South. Our attendance varied from 30 to 50. While it is difficult to get firm commitments so soon after the 50th, several classmates have expressed interest in an interim reunion in '68. Apparently early October at the time of autumn foilage color is the most popular season. Our official photographer, Stan Lane, has some excellent photographs of Reunion events. Also Ken Childs, Ken Bell, Stan Dunning and Dick Lyons have sent in some good prints. We hope to put together a representative group of Reunion pictures in our post-Reunion bulletin which will be published later this fall and sent to our mailing list. We are still working on a memorial gift to the Institute in honor of those of our classmates who have gone before. Several of our widows have al-

ready contributed to this project. We hope to make an announcement concerning this at a later date. As I write these notes (August 30th), we are preparing in Cambridge for the 5th Alumni Seminar, September 8-10. The subject is a very vital and timely one, "Cities in Crisis." We hope to see a good representation from the Class for this event. The Alumni Officers Conference will be held in San Francisco this year September 29-30. Your President reports on the activities of the Long Range Planning Committee of the Alumni Association as General Chairman of this committee. This has been a major undertaking, requiring two years and utilizing the efforts of nine sub-committees and a total of 92 people. (Sounds almost like running a 2nd 50th!) The important sub-committee on communications was headed by our esteemed classmate Ray Stevens. We can say without equivocation that the contributions of the Class of 1917 to this project have been substantial. Now I turn the rostrum back to Dix Proctor for his comments."

The 50th Reunion is now history and with it a lot of memories and items to be recorded in due time. If you didn't notice it in our President's letter of July 1, our 50-year gift was a record \$897,685, and, additionally, 32 classmates signified that M. I. T. would realize \$2,410,450 from their estates. This is the reason our very capable Chairman of the Fund required the heavy body guard of retired and active Army members in escorting him to the speakers table at the Alumni Day luncheon. Don Severance, our honorary member, advises that the total attendance at some or all events of the weekend for our Class was 96 alumni, 70 wives, and 6 widows. Don further comments that to the best of his knowledge there were 79 members in cap and gowns on the stage. Tubby

The memorable weekend for the Class of 1917 began on Thursday afternoon, June 9, in the spacious lounge of McCormick Hall on the M.I.T. campus. There were refreshments, handshakes, and reminiscences in every corner of the room.

Strout not only did a perfect job on accommodations at the Chatham Bars Inn, but he also did the same with the weather. Quoting his letter of August 1, "We surely were lucky on our weather. It has been awful here ever since, rain, hot, muggy and ugh." He further comments, "It seems strange to see the 50th rapidly fading into the past after all the time that was spent putting it together. I imagine Al Lunn is thankful it is over, as all the work and detail fell on his shoulders." . . . Stan Dunning writes as of August 31, "I wore my blazer to the Lanes the other night. Stan, our new Treasurer, had his on, but Al Lunn did not have his out of the moth balls." In case someone wants to know about the color pictures that Stan Lane took of us in the gowns, he only has movies and it is too bad nothing can be taken out to give us a good color picture. However understand that John Mattill, Review Editor, has some black and whites. Incidentally, the Lanes are just back from an interesting Scandinavian trip. Maybe we can include his movies of this trek along with all the slides and movies of our 50th at our next reunion.

For those classmates who did not make it on Commencement Day the records should include Penn Brooks' address at the luncheon under the big tent in the main court. "President Johnson, Dr. Killian, members of the Class of 1967, my classmates of 1917, ladies and gentlemen: I had rather expected to be among the very first to offer congratulations to the Class of 1967 on their graduation today, but I find myself rather down the list. But the congratulations of the 50thyear class, for whom I have the privilege of speaking, are nevertheless very sincere and warm. After all, we know what it means to work hard for four years here at the Institute, and then be awarded with our degrees. Yours is a great ac-

complishment. We wish you well in the years ahead. Now I want to congratulate my Class of 1917, first, on making their 50th Reunion, (When one waits 50 years for a reunion and makes it, this is an accomplishment in itself!) then, on coming to the Massachusetts Institute of Technology when they did and graduating when they did. From what I have seen of recent classes since coming to Cambridge a few years back, I fear some of us old fellows might have difficulty in entering, to say nothing of graduating, under the standards of excellence which prevail today-standards which you of '67 have met. Then I congratulate my classmates on their choice of lovely young wives who have stuck by them and furthered their progress for the greater part of the last 50 years. Such a partner is a great help. I can assure you of that as I speak from experience. Now the Class of 1917 is the one and only spect. Of the more than 100 classes which have graduated from the Institute, the Class of 1917 is the one and only which is three-quarters Boston Tech, and one-quarter M. I. T. Three of our four undergraduate years were spent on the other side of the Charles River. For three years we labored on Boylston Street, shuttling back and forth from Rogers to Walker, to Engineering-A-B-C, and Pierce and that horrible place called the union, remembered for it's mission furniture and poor food. This routine went on, week after week, from early Monday morning until noon on Saturdays. We were in what our detractors called 'That Tech factory.' 'No student life,' these detractors said, 'brown baggers.' Well, these characterizations, these derogatory remarks, made little if any impression on us. We had chosen a school where men came to work, not a place for boys to play!

"Let me tell a story. It was at the beginning of our career at the Institute, on the occasion of our freshman class dinner (banquet as it was called in those days). Following the dinner there was a 'consensus.' Without premeditation or plan the Class formed in ranks of four and proceeded to march down Boylston Street toward Tremont Street. All was perfectly orderly until a trolley car coming from Tremont Street literally charged us. This was too much for the spirited class of '17, and we broke ranks to stop that trolley. But the electric motors were too powerful, and the trolley gained on us. At that moment one of our brave classmates ran to the rear of the car and pulled the trolley. Without those motors we could handle the car, and did so, pushing it right back where it came from -to Tremont Street. Now that was an early example of Class teamwork. Unfortunately, the story has a sad ending. Our brave classmate, the one who pulled the trolley, fell directly into the arms of the Boston police, while the rest of us sought sanctuary in oblivion. I cite this instance to show there was spirit in this Class. Then the Institute moved to Cambridge across the Charles. This was to be for us the promised land. Here we were to enjoy the loudly acclaimed pleasures and alleged benefits of campus life. Un-



der the benign influences of the great dome we were to have the experience of being humanized. Sweetness and light were to enter our drab existences. For the first time, so it was said, we were to be considered the whole man. My own case illustrates the metamorphosis we underwent. For three years I was what some have called callow youth from the state of Maine. One of my classmates once said publicly that it was not until my junior year that I got my insteps cleaned out. But once on this side of the Charles I had my shoes shined! My story illustrates what happened to each of us in one way or another.

"Now with this brief account of our unusual undergraduate experience at M. I. T. and when you add to this the rough ensuing 50 years, don't you agree with me that these men of the Class of 1917 look well preserved, matured? Graduation to them was but the commencement. They look prosperous. All millionaires, practically so, at least willing. Liberals. There might even be a few Democrats among them. I am sure that had we not had to prepare for war and then go to war in the spring of 1917, M. I. T. would have done great things for us of Boston Tech. You of the class of 1967 have been making memories these last four years and will continue doing so through your graduate years. Fifty years from now those memories become recollections-some true, some false. I suppose in the minds of most of us no recollections of those far-off times are sharper than of the members of the Faculty who served us so well. M. I. T. has always had great men on its Faculty from the days of Rogers to the present. I think we were singularly blessed with the dedicated, learned men under whom we worked. They were men of great personalities. I am sure it is recollections of their personalities rather than of their learning which remain with us today. I am going to mention a few of my recollections for the amusement of my classmates. Professor Talbot, our lecturer in chemistry, had a beautiful carefully trimmed beard. By the way, in our time it was the professors who wore the beards. He appeared at his lectures always wearing a carnation in his button hole. His lectures were not what could be called inspiring, and once in a great while some student became so bored he would open a newspaper. Professor Talbot's eye was sharp and when he spotted such a culprit, he stopped just where he was, possibly half through a sentence, and stared at him. Pretty soon the whole class followed his line of sight. The silence was ominous. Suddenly the man put down his paper to see what was happening. Sensing he was the focal point of several hundred eyes, including Professor Talbot's, the newspaper went under the seat amidst great confusion. Professor Talbot continued the sentence just where he left off without even splitting an infinitive.

"Then Professor Cross, with his nicely trimmed white fringe beard. His physics lectures were dull but never dry, if you remember! Professor Tyler of mathematics, his was a scraggly beard. I think he trimmed it by biting. But no more devoted man to the students than he. Molly Pearson of English, with his 'unity, coherence, and Emphasis.' And Blackie our German professor who when trotting along Boylston Street would look back every ten paces to see who was following. We often wondered about that. Dr. Dewey in his pepper and salt tweed suit lecturing to us in Huntington Hall on economics. Dr. Dewey was a philosopher, and friend, as well as an economist. I remember, years after graduation, speaking to him about my concern for the national debt which, as I recall it, was at that time 20 odd billion. To my astonishment he said he thought the national debt could rise to some 40 billion without permanent harm to the economy There are a number of questions I would like to ask Dr. Dewey today. And of course, Dean Burton. In those days the Institute had only one dean. He was undergraduate, graduate, academic, student, dormitory, freshman, and dean of women, all rolled into one. But of course those were the days when we were centralized here at Boston Tech. Some of us can remember at summer camp, where many of the engineering students went between their sophomore and junior years, that Dr. Burton was authority. He was everything, the establishment. One night, long after bedtime, a disturbance arose in the camp. The noise and commotion mounted. Dean Burton, aroused by all the clamor, stepped into a pair of shoes, put on his hat, and clad only in his nightshirt, no pajamas I would have you know, walked down the camp street. He spoke not a word. Back and forth he strolled. The noise lessened, the students slunk into their tents, the commotion died down. Dean Burton went to his tent took off his hat, stepped out of his boots and went back to bed. What do you suppose Berkeley would give for a dean like that?"

"Now if I may speak for a moment, in a more serious vein. You members of the Class of 1967 are leaving here (or will after you complete your graduate work) marvelously equipped to meet the problems of the last third of the 20th Century. You possess vast knowledge in the field you have chosen. You have been inculcated with the desire to solve problems, of going from the known to the unknown; and you are provided with tools and ways of doing so. And unless you are different from all other Tech men, you seek action, the opportunity for creative accomplishment. These are your equipments. They are precious. But in the industrial world you will now or shortly enter, I see great difficulties you will have to surmount. These difficulties may be aggravated in the remainder of this century. To meet them and surmount them you are going to need more than the blessings which M. I. T. has bestowed on you. These plus requirements are qualities of the spirit. You are going to need courage, the willingness to risk, to dare. Many of you, whether engineers, scientists, behaviorists, or those entering on a career in management, will find yourselves in the grip of bigness, or

in the maw of this new industrial phenomenon, these 'conglomerates' which are raising their heads in increasing numbers. How these giants, these new industrial creations, can be successfully managed is not clear. Certainly they are potential breeding grounds for industrial bureaucracy. Our great American industry was not built on bureaucracy. It was built on strong men, men who overcame frustrations, who broke through barriers in ceilings. Industrial bureaucracy begets pettiness. Where it occurs in the ranks above you it will be frustrating. Where it does not exist your knowledge and ability and courage will be welcome, provided, of course, you are right! So I say to you: Illegitimatis Non Carborundum, which, in free translation means, 'don't let the bastards grind you down.' In closing I want to speak of something our two classes, separated in time by a half a century, have in common. For 50 years those of us who graduated from this place in 1917 have had an ever-growing, expanding alma mater behind us. As it grew in statue, as it expanded it's usefullness to the country, to society and industry, it progressively enhanced our own status and cast luster on it's sons. Long after our graduation and the distinction we thereby then had, M. I. T's expanding greatness touched our lives. Not all universities and schools do that for their graduates. And M. I. T. will do this for you in the next 50 years. Remain close to it and to your classmates. The rewards will be great-1917, 1967, 2017. May you have fair skies on your 50th Reunion!"

If you have read this address of Penn Brooks, I believe you can agree that his memory is still sharp. Penn comments on the 50th, "As I saw faces, some of whom I recognized which I had not seen in some cases for 50 years, how much I wished I knew what these men had been doing, particularly during the latter part of their active lives. Say, the last ten years I had kept up with so very few of them, yet I wondered how they had been faring, their contributions, their rewards and their satisfactions. I made up my mind to one thing, that whereas in the past I had been very careless about responding to the requests of the Secretary for infromation about oneself, from now on when I get such a request, I am going to comply. I had never believed that others would be particularly interested in my doings, but now that I realize how much of an interest I had in the doings of others, I feel I must at least expose myself. As one result of the Reunion I hope many of us are going to see more of one another than we have. It will be a great joy to Carol and me to have you and so many of the others drop in here (Buxton Farms, Millboro, Va.) sometime and see how we live back in the deep country." What of Beacon Street!

At the banquet at Chatham Bars Inn **Bob Erb** made an exquisite presentation entitled, "Branch water not good without flavoring." This to Stan Dunning, Chairman of the Publicity Committee of the 50th Reunion, Alumni Council Representative, Assistant Secretary, etc., for

his very generous leg work in preparation for the Reunion. . . . While at Chatham Bars Inn two athletic figures went swimming in the inlet, Ken Bell who claims he never shivers and Enos Curtin who reported the ocean nice and cool. Incidentally, Ken previously wrote, "We had a quiet but satisfactory winter in Palma, Majorca, with delightful days on the sea, 14 going, with the shore trips at Funchal, Maderia: Casablanca: Gibraltar (our first time on the Rock although we have stopped there many times); Naples; Genoa; Cannes; Barcelona. Returning we left Barcelona stopping at Alicante and Funchal. The gourmet food is not conducive to weight loss! Don and Mrs. Webster, 1916; Lewis Southwick, 1910; Paul Cumings, 1907, all equipped with wives, and the Dex Tuteins, were all in Palma when we were there."

Dick Loengard assisting golf pro, in the absence of Ray Blanchard, advises the following prizes: low gross to Samuel L. Kuhn, name tabs for clubs; low net to P. J. Maher, club covers, and nearest to the hole, Ken Lane, golf balls. "Ray is in fine spirits and we (Stan Dunning and Al Lunn) had an excellent visit. Ray gets around remarkably well. He was most gratefull for the scroll signed at Chatham by his classmates and enjoyed the pictures very much. Ray lives on the edge of a golf course, and his cronies come up and chat with him as they go by." The Newark News of Newark, N. J., of June 1 ran the following announcement: "M. I. T. honors A. R. Brooks of 10 Blair Place, Summit, N. J., a 1917 graduate of Massachusetts Institute of Technology, World War I Ace and retired executive of Bell Laboratories, on May 24 with the Distinguished Service Award of the M. I. T. Club of Northern New Jersey at it's annual meeting at the Hotel Robert Treat. Brooks is a charter member of the Club and was President in 1945-46. He has been an Honorary Secretary of M. I. T. for 30 years and was Secretary of his Class which is having it's 50th Reunion this year. He retired from Bell in 1960 as Supervisor of the Publications Department, and had also served as Head of it's Aviation Division and as Chief Pilot. The Award citation reads as follows, "A Framingham, Massachusetts, High School valedictorian, you were graduated from the Massachusetts Institute of Technology with a bachelor of science degree in electro-chemical engineering in the Class of 1917. You held positions with the publishing firm of Frank P. Bennett & Company; the Florida Alrways Corporation; in civil aviation with the U. S. Dept. of Commerce; on the Technical Staff of Bell Telephone Laboratories, Inc.; as organizer and head of the aviation division and later on the laboratories staff for a total of 33 years to your retirement in 1960 as Manager, New Jersey Operations, Publication and Public Relations Department. At M. I. T. you were Secretary of Pi Delta Epsilon, President of the Catholic Club, Editorin-chief of The Tech, the first Chairman of the Dormitory Committee, a member of the Institute Committee, the Electrical Engineering Society, the Engineering Corps, and the Tug-o-War team. You have

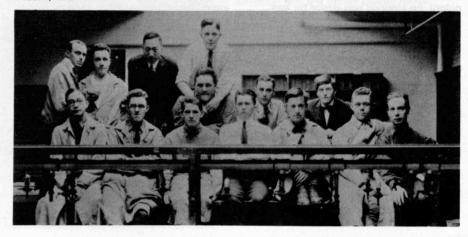
served M. I. T. as an Honorary Secretary, and member of the Educational Council for 30 years, and you are a Class Agent of the 50-year class. A charter member of the M. I. T. Club of Northern New Jersey, you have been Chairman of it's Scholarship and Admittance Committee, Program Chairman, Secretary, member of the Executive Committee, the Board of Governors, and it's 11th President, 1945-46. You are an Associate Fellow of the American Institute of Aeronautics and Astronautics, a member of the Quiet Birdmen, the American Legion, the Frank B. Jewett Chapter of the Telephone Pioneers of America, Military Order of World Wars, order of Daedalioms, Old Guard of Summit, N. J., Air Force Historical Foundation, and Archie Club of Boston. You have given outstanding service to your country. You were graduated from the Field Officers School of the U.S. Army while a captain, U. S. Air Service, assigned to active duty overseas as a pursuit pilot, then a flight commander and a squadron commander in the American Expeditionary Forces of World War I, as well as a commander of Regular Army Units, 1917-23. You are the only M. I. T. alumnus to have achieved the high distinction of attaining the status of ace in the First World War. You were cited by the Commander of the First Army Air Service and awarded the Distinguished Service Cross for extraordinary heroism in a successful engagement with eight enemy planes. You have been singularly honored in the placing of your Spade pursuit plane on permanent display in the National Air Museum of the Smithsonian Institution, Washington, D. C. It is now the great pleasure and privilege of the M. I. T. Club of Northern New Jersey to present to you, as a token of our appreciation for your eminent achievements, the Outstanding Alumnus Award Of 1967."

Here are a few address changes: Charles A. Abels, Groton House, Apt. #6-60 Washington Park Drive, Andover, Mass. 01810; Morris M. Brandegee, 761 Lake Road, Youngstown, N. Y. 14174; Stanley C. Dunning, 6 Jason Street, Arlington, Mass. 02174; Augustus P. Farnsworth, King Road, Etna, N. H. 03750, "Retired May 1, 1965, changed legal residence to

Pictured in a chemistry lab during undergraduate days are top row: --, --, --, Robert Van Kirk, Bernard O'Daly, Smith, --; bottom row: Sam Barron, George Ekwall, Marshall (?), Donovan, Weber, Stanley Franklin, Waldemar McGuire, all of '18. New Hampshire as of June 1, 1965, now spend about eight months May through December at our farm, Lookaway, in Etna Hanover"; Charles C. Gager, 70 Beach Pond Road, Groton, Conn. 06340: Paul Gardner, Lincoln, N. M. 88338; Elijah Levi, 1082 Georgia Ave., Silver Spring, Md. 20902; Willard B. Newell, R. D. #2. Box 656, Kennebunkport, Maine 04046; Clarence K. Seely, RFD #1, Box 492. Monroe, N. Y. 10950; Erling B. Stockmann, Dingley Dell, Pemaquid Point, Maine 04561. lu-Sking Wan, 232-A Prince Edward Road, Kowloon, Hong Kong, deceased November 26, 1966.-C. Dix Proctor, Secretary, P. O. Box 336, Lincoln Park, N. J. 07035; Stanley C. Dunning, Assistant Secretary, 6 Jason St., Arlington, Mass. 02174

18

So now we approach our 50th Reunion! There is something special about college classmates. Their friendships need no artificial respiration to be revived after long periods of separation. They come alive spontaneously, like awaking in the morning, with zest for a renewed day's work. Present at last June's Alumni Day were Mr. and Mrs. Sam Barron, Mr. and Mrs. Tom Brosnahan, Mr. and Mrs. Sax Fletcher, Mr. and Mrs. Clarence Fuller, Mr. and Mrs. Al Grossman, Mr. and Mrs. Julie Howe, John Kilduff, Mr. and Mrs. Tom Kelly, Mr. and Mrs. Leonard Levine, Mr. and Mrs. Ed Rossman, Mr. and Mrs. Max Seltzer. . . . From Sam Barron (712 Eastwind Drive, North Palm Beach, Fla. 33403) has been received prints of some old photos which I hope the Review will publish, one by one. The first one was taken in a chemistry lab, probably in '16 or '17. Sam partially identifies them: -, -, -, Van Kirk, O'Daly, Smith, -: Bottom row Barron, Ekwall, Marshall (?), Donovan, Weber, Franklin, McGuire. . . . The University of California gave Arthur C. Hardy an honorary doctor of laws degree last June in recognition of his contributions to the science of color, especially the invention of the recording spectrophotometer and assisting in the development of sound for motion pictures. . . . Palmer Giles says he



has gotten beyond most of the frictions and frustrations of a long life and so strives to finish it out gracefully. "I do not break horses any more. Life at Hillingdon Ranch (Comfort, Texas) agrees with me. If any of you can visit for a few days or weeks, I guarantee to give you a good time riding cross-country in a jeep, feeding livestock including wild turkeys and deer. Ranches here are so far apart each one has to keep its own Tomcat. At 73 I am living on extra dividend time, but enjoying it immensely with plenty of grandchildren to increase the pace and vividness of the adventure."... Because of a signature blurred by being stuck on the envelope flap, it is necessary to assume the following comes from Mrs. H. Loring Wirt (care General Electric, Schenectady 9, N.Y.): "The opportunity to write comes my way because Loring concentrated on highly technical material. This was beautifully written but his social and other correspondence have not developed equally. We face old age with gratitude to the past, courage for the future, and joy in our grandchildren."

Walter Engelbrecht (1233 E. Thomas Rd., Phoenix, Arizona 85014, sends a thumbnail biography: "After finishing M.I.T. I went to Oklahoma in the oil business. Worked for 30 years with Phillips Petroleum. Retired February 1, 1958. Moved to Phoenix in September 1963. Saw Joe Kelly in my travels for Phillips. Think I will move back to Bartlesville, Oklahoma. Getting old and have many friends there. Hope you feel well.". . . Sherman MacGregor (11029 51st Ave. North, St. Petersburg, Fla.) reporting on his hospital adventure of last spring says, "Fortunately, time means little to me. I never expected to spend six weeks on this deal, the long wait for the operation, two weeks after surgery before I could go home, two more before I would feel normal. A friend who should know says I was in the most beautiful V.A. Hospital in the U.S. We had no rain in over two months, and it was spring! I had a nice letter from James Edward Longley." . . . Len Levine (1571 Beacon St., Brookline 02146) says, "We had a lot of fun Alumni Day. The 50-year fund was discussed, and Sax is concerned to get it steamed up. I was retired for age last January by the Army lab at Natick, Mass., where I had been doing research and development work. Gladys and I went to Florida in February intending to buy a home. After a month of idleness I was fed up and came back to Boston to teach mechanical drawing and design at a Boston trade school. It gives me something to do. Also I find working with young men quite stimulating. So, as history repeats itself, I'm back doing the kind of things we did as juniors and seniors. See you at the 50th.". . . Herbert Larner, from Baden-Baden, Germany, addresses your scribe as, "Sehr gemuthlich Herr Prof:- Hier in das Vaterland alles in ordinary ist. Gchwelgerei (riots) is verboten. Das ist bestimmt! Mit besten Grussen aus Deutschland, Ich bin Ihre, Herb." Ach, mein Lieber Freund Herb, Sie sollen die Madchen hier sehen. Sie sind wunderbar gestacht! Larner has

also been most helpful in sending me clippings, including the Paris edition of the Herald Tribune for August 25. The main article on the front page, with a three-column-wide picture of our Bill, says, "William C. Foster, the U.S. representative, told the disarmament conference that the long-sought agreement to bar further spread of nuclear weapons to nations which do not now have them, is now within reach." The New York Times, the Boston Herald, and probably all important papers across the continent, carried similar photographs and articles. Bill came home from Geneva on August 9, on August 11 was urgently asked by the Russians to return, and a treaty was soon "within reach." The inferences to be drawn are delightful! In May Herb sent me a New York Times clipping to the effect that Bill had gone to Tokyo in an attempt to convince Japan that the proposed treaty would not hamper her growing industrial uses of nuclear power. To my surprise Herb has a love of good poetry not common to most M.I.T. men. He even shares my minority opinion of Robert Frost, enthusiasm for Thomas Grey, Alexander Pope, and realization of the agony and the ecstasy that went into a little book of poems called The Whispering Leaves which I had privately published in 1964. A second edition is in the offing.

David McFarland (102 W. Rosedale Ave., West Chester, Pa. 19380) is another thoughtful classmate who garners items for this column. In addition to the last two items below he says, "Saw Sam Chamberlain at the Williamsburg Antique Forum last winter. On our way to Florida stopped to see Dick Wilkins at his attractive place in Summerville, S.C., where he enjoys life. I saw that May 25 threeinch snow you wrote about. We saw Harold Weber in Mason, N.H., on our way to Stowe, Vt. I didn't remember Robinson from our college days, but met him several years ago at an M.I.T. club banquet at Longwood Gardens. We were the only two men of '18 there."... On July 13 Walter Robinson died from a heart attack at his home in Lionville. Pa. After World War I he invented some equipment which he sold to the Thomas Edison industries, and later manufactured himself. He served the Sun Oil Company as an engineer, retiring in 1958 at age 65. He is survived by his wife, four daughters, and 12 grandchildren. . . . Courtesy also of Dave McFarland, I learned that "the handsomest man in our class," Donn Burton, died on May 17 (828 Gatemore Road, Bryn Mawr, Pa.) Donn had been a partner in Hutchinson, Revinus and Company insurance brokers. A wife, a son, and a sister survive him. . . . I have no details concerning the February 10 death of Edward S. Carter (40 So. Randolph Ave., Poughkeepsie, N.Y.)-F. Alexander Magoun, Secretary, Jaffrey, N.H. 03452

19

Greetings after a good wet summer. You have all received word from **Don Way** about our 50th, but please don't wait

until then to send in news for the class notes. . . . Roy Burbank, Mr. and Mrs. S. Albert Kaufmann, Dean Webster and your Secretary attended Alumni Day in June. It was a good program and interesting to hear from our President Johnson and to see throngs of our old contacts of 50 years ago in the classes of '16, '17, '18, '20 and'21. . . . Robert B. Mac-Mullin, X, received the Silver Beaver Award from the Niagara Frontier Section of the Boy Scouts of America in April 1967. This is the highest award for a local section. . . . Hyman Spector passed away on July 9, 1967. He was an officer of Allied Shoe Company. . . . Phil Rhodes, naval architect, was interviewed by the N.Y. Times about the sailboat Cup races coming the week of September 11. Phil designed the Weatherly which defeated the Gretel of Australia five years ago. He has designed many winning racing boats and some years ago gave a most interesting lecture to the M.I.T. Club of New York at one of their dinner meetings on this subject. . . . Your Secretary will be at 1111 Casuarina Rd. Delray Beach, Florida 33444, from January 1 to April 1. Phone: 305-278-4537. He will be in South America the month of December.-Eugene R. Smoley, Secretary, 30 School Lane, Scarsdale, N.Y. 10583

20

Attendance on Alumni Day last June was unaccountably sparse. The only members of the Class detected were Al and Betty Burke, Bill and Barbara Dewey, Bat and Irene Thresher, Herb Federhen and, I believe, Mrs. Federhen (although I never set eyes on them), Dorothea Rathbone, Frank Badger, Ed Ryer, El and Al Wason, Bob Patterson and, of course, your ubiquitous Secretary and his Amy. . . . Dolly Gray writes, "My son Harland Jr. graduated from M.I.T. and later was killed in foreign service with the U.S. Navy. He is buried in Arlington National Cemetery, a It. commander. Our youngest daughter is married to another M.I.T. graduate with a doctor's degree and now well up in Standard Oil of New Jersey. I retired from Alcoa in 1961, have a winter house in Sarasota and a summer house in Maine, travel, work for Arvida Realty on Bird Key, Sarasota, and am busier, happier and more relaxed than at any time in my 69 years. I remain happily married to the girl I met in Boston 47 years ago." . . . Harold Bennet writes from 5072 Tennyson St., Denver, Colo., "I received an honor award from the Department of the Interior for meritorious service with the Reclamation Bureau for design, checking and supervision of design of structures of the largest power plants in the U.S., namely Hoover, Grand Coulee, Shasta, Hungry Horse and several dozen other since 1932. This with thanks for the training in Course I under Professors Spofford, Barker, Sutherland and others. After retiring in 1960, Mrs. Bennet and I have spent most of our time traveling from Colorado to California, Canada, Florida as well as 7000 miles of the British Isles by auto. It is a great life with not enough time for our home hobbies."

Bob Sumwalt writes that he got in touch with Snug Etter when in San Francisco last June and that Snug is retired but does some consulting work. Bob reports that Snug has had an outstanding career and that both he and Snug have decided to attend the 50th in 1970, "even if we have to come in wheel chairs." Harold Etter lives at 1835 Willow Road, Hillsborough, Calif. Robert Sumwalt's home is at 733 Sweetbriar Road, Columbia, S. C. Bob retired from the presidency of the University of South Carolina five years ago and says he is busier than ever. Various boards and committees keep him occupied Francis Sears, who is Chairman of the Department of Physics at Dartmouth, and his wife Mildred toured Germany, France, Spain and Portugal by automobile last spring, then spent a few days in England before returning to their home in Norwich, Vt. Marion Sanders, the squire of Wytheville, Va., was recently elected a director of the First National Exchange Bank. He is also president of the golf club there . . . Ed Burdell, referring to the tragic death of our beloved Flossie Fogler Buckland, tells of an incident that was so typical of her. When Ed visited Schenectady during the 1930's as Dean of Humanities at the Institute, Flossie rigged a fake telephone connection into the meeting room over a loud speaker. In a disguised voice she posed as a charwoman at General Electric as well as an old girl friend of Ed's from the Central Square, Cambridge, area and insisted that Ed had made promises of marriage which were broken, as a result of which she had lived a life of penury, want and shame. Ed says, of course, nobody but Flossie could have brought it off, and she had the alumni at the meeting in an uproar and the new dean very much confused. Ed admits that he retired for the third time last year, but to keep from being bored he has hung up his shingle as an educational consultant. At the invitation of the President of Georgia Tech he went to Atlanta to discuss with him and the faculty the cultural enrichment of the engineering curriculum along the lines of what was done at M.I.T. To everyone's astonishment the students organized a rally, inspired by Ed's presence, at which demands were made for more English, history and social science. Besides conferring quarterly with the trustees of the Cranbrook Foundation near Detroit, Ed has organized a science advisory council, composed of local scientists and engineers, to set up a long range program for the Central Florida Museum in Orlando. He has also taken on the chairmanship of the Committee on Service to Military Families in his three county chapter of the Red Cross. Says Ed, "If any of our classmates enjoy retirement more than I do, I wish he would speak up." Ed's house is 521 Dommerch Drive, Maitland, Fla.

From the Gilarmi Apartment Hotel, Makati Rizal, Philippines, comes a most interesting and welcome letter from Harry Kahn, reminding me that the last time he wrote he was in Iran with the International Executive Service Corps getting a ceramic tile plant in proper operation. Now he's on a sixmonth assignment in Manila even though he formally retired in 1965. His present tile plant is large, modern and employs some 350, but he says that the letters M.I.T. still exert the usual magic. He is busy improving quality, increasing production and reducing costs. Equipment comes from Italy, Australia, Germany, Japan and the U.S. Raw material comes from as far as Holland. For visa reasons he has to make a trip to Hong Kong every 60 days. Harry says it has been hot, humid and rainy there all summer. "Like most of the developing nations," says Harry, "great luxury and unbelievable squalor live next door to each other, and there's practically no in between." In their spare time Harry and Hannah tour the country inspecting the rice paddies, water buffalo herds, tropical fruit and coconut plantations, not to mention erupting volcanoes. Harry asks to be remembered to you all. Needless to say, our many world travelers have been active this summer. Betty and Norrie Abbott toured the Swiss Alps with side trips to Paris and London, Germany and Holland. In August they flew to Cheyenne, Wyo., to attend their son's wedding and drove back Foster Doane has been in Guatemala City evaluating a paper mill. He says it's a beautiful and interesting country, full of indians wearing different costumes in each area Perk Bugbee presided at international fire prevention meetings in Paris and London. . . . How many of you visited EXPO, and did you enjoy it as much as Amy and I? . . . Alden W. Miller's address is 1019 W. Mission Lane, Phoenix, Ariz Charlie Klingler is in La Jolla, Calif., 939 Coast Blvd. . . Ray Reese's address is 743 So. Byrne Rd., Toledo, Ohio. . . . It is with deep regret that I report the deaths of Dr. Frederick A. Brooks of Davis, Calif., Henry W. Erickson of East Dennis, Mass.. and Robert A. Miller of Rumson, N. J., and formerly of Bell Laboratories As these notes are written, your Secretary is looking forward to the National Alumni Officers Conference in San Francisco and hoping to see some of you there. Harold Bugbee, Secretary, 21 Everell Road, Winchester, Mass. 01890

21

With the start of a new volume of the Review, we again extend greetings and a warm welcome to the long-time participants as well as to those who have just dropped in on us for our 47th year of these monthly meetings around the friendly fireside of the Class of '21. The logs burn brightly, and the sparks that fly from the glowing embers mark the myriad of bright events involving members of the Class-some of which we are able to chronicle here because of your kindness in sharing your news. Our sincere thanks to you for helping make these records complete and easing our burden in preparing them. Please continue telling us about your activities, whether you're still on the job or in retirement; about your travels, your family, honors, awards, hobbies or whatever comes to mind after you start writing: "Dear Cac, it's a long time since I've told you about . . ." You pick it up from there at least once between now and the end of this volume next July, or every month if you wish. We enjoy hearing from you, and that goes for the Class, too. Our interim reunion in Mexico City last spring and Alumni Day in June both served to observe the 50th anniversary of the formation of the Class of '21. The actual date, September 24, occurs as this issue is in preparation. Headlines in The Tech of that date back in 1917 read: "Class of 1921 is largest in history of the Institute-504 freshmen enter this year." Editorially, the paper welcomed the new class: "Today marks the beginning of a new organization, the Class of 1921. From now on there will come into existence traditions, experiences and characteristics particularly identified with that organization . . . " And, as a large element of the total student population of 1650 then at Technology, the Class of '21 started to establish those traditions almost on the spot. To this day there still is no end to the creative pattern on which its experiences and characteristics and the origination of new traditions continue to be based.

On the eve of Alumni Day, Helen and Ray St. Laurent, Maida and Ed Dube, Rigi and Saul Silverstein and Maxine and your Secretary enjoyed dinner together at the Charter House in Cambridge and then saw the impressive special color film shown in Kresge Auditorium. Registration the next morning provided the usual opportunity for meeting others of the Class and embarking on a series of vital seminars and course and activity social hours. Impressive memorial services in the chapel were followed by the always enjoyable luncheon, with '21 gathered together in the Great Court to hear our distinguished new member of the Class of '21, President Howard W. Johnson, discuss most effectively his year heading the tremendous organization which is M.I.T's modern "coeducational university polarized around science," as our beloved Jim Killian, '26, has so aptly phrased it. An organ concert in Kresge was the prelude to an exciting color film of his walk and work in space during the flight of Gemini 12, narrated in person by Astronaut Edwin E. Aldrin, Jr., A.A.E. '63, son of our Brielle neighbor, Ed Aldrin, '17. The champagne social hour in the student center preceded another '21 get-together for dinner, after which we returned to Kresge for a delightfully varied program of entertainment. Then there were those who wandered back to the student center afterwards for dancing late into the night. Sandwiched in between some of the afternoon events, a large group of your Class officers, committee chairmen and other representatives met to plan, with the Alumni Association, part of the program leading to our 50th Reunion in 1971. In attendance at Alumni Day were Helen and Mich Bawden, George Chutter, Maxine and Cac Clarke, Claudia and Josh Crosby, Kay and Ed Delany,

Maida and Ed Dube, Helen and Ed Farrand, Hartwell Flemming, Sarah and Harry Goodman, Ruth and Irv Jakobson, Anne and Mel Jenney, Mildred and Col. Phil Johnson, Laurie and Chick Kurth, Emma and Al Lloyd, Helen and Bob Miller, Kay and Phil Nelles, Larc Randall, Paul Rutherford, Helen and Ray St. Laurent, Celia and Steve Seampos, Bill Sherry, Rigi and Saul Silverstein, Ted Steffian, Anna and Bill Wald, Frank Whelan and his daughter, Anne.

Helen and Ed Farrand have sold their famed Kinchafoonee Lodge residence and the numerous buildings comprising a 256-acre wooded beauty spot in south Georgia on the Kinchafoonee Creek in Leesburg. They have bought a new home in a lovely area high on a hill overlooking the California coast, where their address is 5981 La Jolla Mesa Dr., La Jolla, Calif. 92037. Son David is also making his home there, whence he has a short drive to graduate studies in business administration at San Diego State College. Ed says that he and Helen made reservations for the Alumni Seminar in Cambridge early in September and for the Alumni Officers Conference in San Francisco at the end of that month, also that he has already participated in M.I.T. doings near home. He and David attended a dinner meeting of the M.I.T. Club of San Diego at the General Atomics Division of General Dynamics Corporation. He remarks: "A scientist gave a rapid-fire account of their way-out activities, with some spectacular gadgetry demonstrations. Then we had a tour of their working model of the reactors they produce for multimegawatt power plants-innocent looking, crystal clear deep wells of water with just a few wires and elements at the bottom." . . . Fred Marlow has moved to what we assume is a retirement home at 606 N. Larchmont Blvd., Los Angeles, Calif. 90004, since we haven't yet received his questionnaire with news as to whether he continues as a partner in Marlow and Company of Los Angeles Palmer Scott, 179 Jordan Rd., S. Dartmouth, Mass. 02748, is engaged in design engineering on fibreglass with Glastronics Corporation, New Bedford, in such special fields as radomes, tanks, church steeples and boat hulls. He has had long experience in the fabrication of fibreglass boats as former president and general manager of the New Bedford firm of Palmer Scott and Company.

It is now Dr. Elmer W. Campbell who receives mail via Box 3, Lovell, Maine 04051, and we are guessing that he has expanded the scope of his public health work by obtaining a doctorate in medicine. Right, Elmer? . . . We note with interest that Irving Whitehouse, Director of Research, Republic Steel Company Cleveland, is listed in the Class of '21 and we express a hearty welcome. Mrs. Whitehouse, also a member of our Class, will be remembered as the former Helen Lord. They make their home at 4409 Renwood Rd., Cleveland, Ohio 44121. Son Thomas is M.I.T. '57. . . Walter A. Jayme says he has moved from

Gary, Ind., to a home at 405 Wearimus Rd., Ho Ho Kus, N. J. 07423, but didn't return the questionnaire so we can properly list him in the Class directory or give details of his move. . . . Edward W. Noyes completed his usual trip to the family's summer home on Coxton Lake, Thompson, Pa., and will soon be embarking on the return to winter quarters at 1410 S. E. 7th Ave., Pompano Beach, Fla. 33060 H. duPont Baldwin has a new retirement home at 37A Cornhill St., Annapolis, Md. 21401 . Preston W. Smith has doubtless retired as professor of mathematics at St. Laurence University in view of his reported change in home address to 20 Cliff St., N. Weymouth, Mass. 02191. We sure would like to have that questionnaire in confirmation and to assure he is listed correctly in that forthcoming directory Willard A. Case writes a welcome note saying he retired last November after 43 years with Anchor Hocking Glass Company. He now receives mail at 935 Rainbow Dr., N.W., Route No. 1, Lancaster, Ohio 43130. We still want that questionnaire form, Bill.

David O. Woodbury, Shore Rd., Ogunquit, Maine 03907, sent a short note: "Dear Cac, I have been working so hard on my third 'Dean Riam' novel I haven't had time to send you any class notes. Not much has happened to India and me except excessive snow shoveling last winter. Have been doing a good deal of writing of one kind or another, including a monthly magazine column and endless letters to newspapers. We attended a three-day course in Washington last March on how to win the election in 1968 -as if anybody knew! If it is of interest, I was a speaker on Dean Clarence Manion's forum last spring, broadcast by 250 radio stations. We worked hard for the defeat of the Consular Treaty in the Senate but missed out by three votes. Senators said their mail ran, in many cases, 200 to 1 against the treaty, but they voted for it anyway. The same will probably happen with the East-West Trade Treaty. We believe Americans will wake up to find they have no country if they don't look out." Albert S. Genaske, 32 Hyde St., Newton Highlands, Mass. 02161, writes: "I retired last April 28 after more than 40 years with the construction division of the Metropolitan District Commission of the Commonwealth of Massachusetts, Boston. My wife passed away a year ago and my daughter, Marion, and her family now live with me. Her husband is in the Air Force. My son, Albert, attended Northeastern and is teaching mathematics at the junior high school in Needham. Hope to enjoy a life of prolonged vacation here and at our lovely cottage on Lake Kezar in Lovell, Maine. This is the third most beautiful lake in the world, per the National Geographic Society. We built in 1949, and our youngsters practically grew up there." Sincere sympathy from all of us, Al, on the passing of Mrs. Genaske Writing from his home at 1329 W. Muirlands Dr., La Jolla, Calif. 92037, Brig. Gen. Ludson D. Worsham says: "Still enjoying Southern California-golfing, gardening and swimming." We assume he has retired from the electronics division of R. M. Parsons Company, Pasadena, which he served as Vice President and General Manager.

A note from Roy D. Snyder, 806 E. 3rd St., Bloomsburg, Pa. 17815, refers to his retirement in 1960 and says he is thoroughly enjoying his current occupation in a consulting capacity as the director of business development for the Miners National Bank of Wilkes Barre Philip R. Payson retired in 1964 from SKF Industries, Cleveland. He writes: "We built a new home in the Tanglewood section at 5031 Northampton Dr., Ft. Myers, Fla. 33901, and have lived there since October 1966. Like it very much.' . . . A phone call this morning as these notes are in preparation turned out to be the cheerful voice of Dug Jackson, somewhere on the New Jersey Turnpike, returning with Betty to their home in Havre de Grace, Md., from New York where they had just arrived by steamer from almost five months crisscrossing Africa, Europe and Britain from Morocco and Tangier to Majorca, Italy, Austria, Switzerland, France, Netherlands, Germany and England. They drove to Brielle for lunch, a pleasant afternoon of sightseeing here and reliving incidents of their trip. We stopped to see Munnie Hawes but he was out on the golf course. Dug and Betty made a trip around the world starting last January and ending with their joining our interim Class of '21 reunion in Mexico last March. They left in April on the tour which ended today, and they are already planning another jaunt to include Scandinavia and more of England. We received a message from Betty last May, written in Milan, extolling the Milan Cathedral and the extensive Victor Emanuel II arcade. Wonder when Dug will find time to edit the zillion color slides he has taken . Philip H. Hatch, 70 Gibson St., North East, Pa. 16428, who retired in 1964 as chief mechanical officer of the Long Island Rail Road, wrote just too late to make the last issue. He says, in part: "The year we spent in Brazil was the most interesting we have ever had, but we're glad to be back in this country. I was with the railroad group of a consulting firm retained jointly by the World Bank and the Brazilian government to make an overall transport survey. Ending the assignment was a good deal like retiring a second time. We have a couple of cruises in mind and will be in the Scandinavian countries for a month before returning to continue the process of catching up with affairs after the year in South America. Last November we had dinner with the John D. Bowmans ('20) and the William L. Knoepkes in Buenos Aires. Best regards to you and the Class."

An article in the Boston Herald on advances in building using plastics and precast concrete panels credits **Ted Steffian** with early recognition of their utility by his having specified the use of composite polystyrene concrete panels in Cambridge offices which he designed. It is commented: "Besides attaining an aesthetic quality with exposed aggregate,

the panels accomplished a waterproof condition that eliminated condensation so destructive to interior finishes." . . Arthur S. Obermayer, President, Molecu-Ion Research Corporation, a research, development and engineering firm at 139 Main St., Cambridge, Mass. 02139, has announced that John J. Healv. Jr., has joined the company as Assistant to the President. Jack retired from Monsanto Company in 1964 where he had been engaged in corporate planning. He lives at 1 Crescent Ave., Scituate, Mass. 02066. . . . Glenn Stanton, one of our famous group of West Coast architects and a past president of the American Institute of Architects, is among the founding fathers of the Architecture Alumni Association, a new division of the Alumni Association of M.I.T. associated with the Institute's Department of Architecture. . . .

A welcome letter from Muriel and Eric Smith, 78 Dufferin Rd., Montreal 29, P.Q., Canada, gives us the addresses of some of our former associates in the Northern Electric Company Ltd. and advises that Anne and Wally Adams and Emma and Al Lloyd have visited the Smiths as part of trips to Expo 67. Muriel and Eric toured Mexico after our '21 reunion there, ending with an extended stay in Cozumel plus a week in New Orleans and at Lake Charles before returning to Montreal in April. Attendance at a wedding kept them from being with us last Alumni Day. Emma Lloyd wrote several letters with news of the Farrands and of the delightful time she and AI had with the Smiths. She also tells of a weekend three-day "camera college" program which they enjoyed at the University of Massachusetts. Now we have a long letter from Anne Adams saying they will return to see more of Expo in September, following their annual stay at a camp for professional engineers in Ohio. From Montreal they will go to Fundy National Park and then stay with us in Brielle on their way back to Ohio from Boston. Maxine and your Secretary plan to visit Expo with others of our local Life Members Club of the Telephone Pioneers of America just before Anne and Wally arrive in Canada. We hope to see Muriel and Eric and be back home in Brielle in time to welcome the Adams couple. These visits serve to heighten the happy times which the Adams, Clarke, Lloyd and Smith pairs enjoyed together when we all stayed at the Hotel Alameda in Mexico City last March The latest in our exchange of recording tapes with Maida and Ed Dube is a full report from Ed of their family activities since we saw them at Alumni Day. They plan to stay with us in Brielle sometime this fall, and we shall be hard put to fashion a local itinerary as interesting as they have done

In between their travels Helen and Mich Bawden live at 10 St. George St., Duxbury, Mass. 02332 . . . Reportedly retired from the presidency of Converse Rubber Corporation, Malden, Mass., Al Wechsler and Pearl are enjoying

more leisure time at their home at 125 Willard Rd., Brookline, Mass. 02146. ... Dr. George F. Lull is still active as the medical director of Cook County, Illinois. He lives at Apt. 1230, 400 E. Randolph St., Chicago, III, 60601 . . . E. Gideon Widell has reported a move from Bloomfield, N.J., to a new home at 200 Harding Pl., Nashville, Tenn. 37205. If this is an indication of retirement, we would especially like to have the questionnaire returned, Gideon, so your news can be properly reported . . Andrew D. Maclachlan, Jr., says he now lives at 51 Mt. Vernon St., Melrose, Mass. 02176. . . . Col. Robert A. Hill, formerly of Anthony, N.M., has retired to a Florida home at 6260 S.W. 144th St., Miami 33158 . . . Another retiree is Elliott G. Peabody, former executive engineer of the Citizens Gas and Coke Utility of Indianapolis who now can be reached via Box 753, Cape Coral, Fla. 33904. Would like to hear from you, Elliott, and have you return that inquiry form Also retired is Capt. William C. Wade who gives his new home as 3901 13th Way, N.W., Patrician Point, St. Petersburg, Fla. 33703. Bill was the senior partner of the naval architectural firm of W. C. Wade Associates in Washington . . . Robert R. Whitehouse, owner of the Maplewood Lumber Company, details his home address as Windemere Park, Unity, Maine 04988 Harold F. Stose lives at 20 Centre St., Yarmouth Port, Mass. 02675.

George A. Chutter has just phoned from Cambridge that the September 8-10 M.I.T. Alumni Seminar is extremely vital and interesting. The theme is "Cities in Crisis." Besides George, attenders from '21 are Joe Morrell, Helen and Ray St. Laurent, Rigi and Saul Silverstein. Pearl and Al Wechsler. In a recent letter from his home on Boulder Dr., East Dennis, Mass. 02641, George told us he had a fine visit with Paul Rutherford and they played golf. Helen and Bob Miller visited Marion and George in East Dennis last June and they planned a return visit in September. The Chutters also saw Doris and Bob Haskel who have a summer place nearby on the Cape. Thanks for the excellent news service, George. . . . We'll have to forego for the present a report on this year's Alumni Officers Conference in San Francisco on September 29-30. Thirty-three members of the Class of '21 have been invited to take part in view of their active association with M.I.T. affairs as officers of the Class, the Alumni Association or local alumni clubs If you were with the '21 group in Mexico last March, you now have the complete directory of the visiting alumni who attended the 19th annual Fiesta of the M.I.T. Club of Mexico City plus the roster of the local alumni and those from Monterrev, thanks to the courtesy of the officers of the Club.

Back in July we wrote of Saul Silverstein's sixth visit to Japan, marking his 23rd foreign trip since 1952. He barely had time to draw a breath on his return before leaving for a business tour of San Francisco and Los Angeles—cut

short by his attendance with Rigi on Alumni Day. Then came another six-week safari, first to Montreal for sessions of the Council for International Progress in Management jointly with the Canadian Council of Management Association and, of course, Expo 67 despite heavy rain. Appropriately, it was Thailand Day and he says King Bhumibol Adulyadei (the son of our late classmate, Prince Mahidol of Songkla) and Queen Sirikit were in attendance. Rigi and Saul then took a long vacation in Colorado, concluded by a two-week seminar forming the executive program of the Aspen Institute for Humanistic Studies. No doubt tomorrow's mail will bring a surprise announcement of the itinerary on which Saul will have embarked for his next trip! . . . Helen and Ray St. Laurent report visiting Expo 67 in June and going to Quebec before spending the summer at their home in Vinalhaven, Maine. Ray says that Graciela and Helier Rodriguez may arrive on this side of the water in time to see Expo 67 and then spend several months between Florida and Puerto Rico. Helier, in turn, had said he was awaiting a visit in Madrid from Bertha and Bob Cook who had planned a European trip in August starting in Spain. Ray writes in part: "Beverly and Ian Clark, '61, of Mexico City and their son, David, stayed with us at Vinalhaven-also Beverly's sister, her husband and son-and we all had a grand time reliving our reunion in Mexico." . . . A card from Sumner Hayward said he was vacationing on Nantucket with his daughter Priscilla. A later note, as we go to press, says he cut short the trip and flew back to enter Valley Hospital near his home, 224 Richards Rd., Ridgewood, N.J. 07450. We just talked to him on the phone and learned that diagnostic checks and x-rays are still underway. . . . Madeline and Rufe Shaw sent a letter from Seattle and a card from British Columbia telling of a trip through the Canadian Rockies and a tour of Alaska. They sailed the Inland Passage to Ketchikan and Juneau, next on to Whitehorse, Yukon and Fairbanks by air. The train to Mt. McKinley National Park took four hours to go 117 miles. They liked Anchorage, whence they went to Nome and then Kotzebue, just north of the Arctic Circle and only some 50 miles from the dateline which ushers in tomorrow. Rufe says they will go to Hawaii and to Expo 67 in August before returning home to 608 Riverbank, Beverly, N.J. 08010. As per his usual thoughtfulness, Rufe sent another grand set of postage stamps he corralled in Canada.

We extend to Herman S. Kiaer heartfelt condolence from the Class on the passing of Mrs. Kiaer, the former Alice Damrosch, eldest daughter of the noted orchestra conductor, Walter Damrosch. Mrs. Kiaer had been the organizer and onetime manager of the first American women's Olympic ski team. . . With deep sorrow we record the passing of two members of the Class and express to their dear ones the sincerest sympathy of the entire Class. . . . Donald Blanchard Lovis, who made his retirement home at

455 N.E. Tenth St., Boca Raton, Fla. 33432, died on May 17, 1967. Don was born on March 4, 1899, in Jamaica Plain and prepared for the Institute at Roxbury Latin School. At Technology he was a member of the first freshman crew, which won the then newly-instituted Field Day event; also the Mechanical Engineering Society and Corporation XV. During World War I he was a private in the S.A.T.C. at M.I.T. He had been associated with the New England Telephone Company for 40 years, retiring in 1962 as an executive in the commercial and directory departments. He was a Life Member of the Telephone Pioneers of America. He is survived by his wife, the former Margaret Spurr; two sons, Richard S. of North Caldwell, N.J., and John B. of Bethlehem, Pa.; and two sisters, Mrs. Alice L. Sasse of Oakland. Calif., and Mrs. Virginia L. Parker of Wellesley, Mass. . . . Ernest Henderson, Sr., of 8 Louisburg Sq., Boston, Mass., died on September 6, 1967. Born in Chestnut Hill, Mass., on May 7, 1897, he attended schools abroad as well as Noble and Greenough and Browne and Nichols and was graduated from Harvard with a bachelor of arts degree in 1918. After service as an aviator in World War I he entered Technology and was associated with us in Course XV. He and Bob Moore of our Class had known each other at Harvard. They formed a small war surplus business and then a series of radio stores. Both acquired real estate, ultimately leaving the radio business to take over the former Stonehaven Hotel in Springfield, Mass., and then the Sheraton in Boston, which started the way to a current ownership by the Sheraton Corporation of America of 153 hotels in ten countries and various other properties. At his death Ernie was chairman of the corporation, one of the world's largest hotel chians. His autobiography, The World of 'Mr. Sheraton,' was published in 1960. He was a collector of antiques, he composed music and played several instruments, he sculpted in metal and wood, he was a photographer, a numismatist, and an avid amateur radio operator. A member of the Development Committee of the Corporation of M.I.T., he was also a trustee of both Boston University and Northeastern University, a member of the Board of Regents of Boston College and had numerous important directorship and associations in financial, civic, communiy and national organizations. His many memberships included the American Academy of Arts and Sciences. He is survived by his wife, the former Faryl Finn; five children, Ernest Henderson 3d, President of the Sheraton Corporation, Mrs. Victoria H. Osborne 2d, Mrs. Augusta H. Petrone, Barclay G. S. Henderson and Mary C. S. Henderson; two sisters, a brother and seven grandchildren. . . . That your Secretaries may enjoy their Thanksgiving as they wish it to be pleasant for you and yours, please write us your news now! -Carole A. Clarke, Secretary, 608 Union Lane, Birelle, N. J. 08730; Edwin T. Steffian, Assistant Secretary, c/o Edwin T. Steffian and Associates, Inc., 19 Temple Place, Boston, Mass. 02111

22

Your Secretary was re-awakened to this new surge of activity of Class notes by reminders of the 45th Reunion from Parke Appel and a good letter from Horace McCurdy of Seattle. Horace and Kate had been sailing in British Columbia waters aboard Blue Peter to recover from their Boston and Wianno excursion. His schedule of activities in Seattle and Palm Desert really do not sound like inactive retirement. In this new academic year of greeting you with post-Reunion news, our salutation should be: to the healthy and wealthy, happy and hippy, informed and boisterous, co-operative and generous, good-looking and farsighted, vigorous and volunteering, modest and interesting classmates of 1922! To those of you who were there, a pleasant reminder; to those not attending, you really missed a whing-ding, not a sit-in but a really big whoop-de-do. The Wianno Club was perfect in location, operation, food and conveniences. In fact it was so good that we have asked them to reserve the same fine weekend for us in 1972. Our most generous wish is that you all should have been with us. Your Secretary returned hastily from the banquet to Buffalo to deliver an "inspiring" address at the Problem Solving Institute of the Creative Education Foundation at the University of Buffalo. For the first time in many years sunny, old Buffalo had had 88 degree weather for seven consecutive days but still had the built-in air conditioner of a breeze from Lake Erie keeping every one comfortable.

Kudos and congratulations go to our re-elected President, Parke Appel, and the loyal group of associates including Bob Tonon, Yard Chittick and Warren Ferguson who selected the beautifully situated Wianno Club as a meeting place, made arrangements through Larry Davis to be properly sponsored and then made out the schedule, picked out the menus and prizes and the entertainment to keep our 120 participants in good spirits for the three days. On the way down Route 3 Thursday, June 8, a heavily loaded station wagon passed us. It contained cartons, fancy packages and Parke and Madeline Appel. A blast on the horn reminded them they were exceeding the speed limit with danger to the safe delivery of the Class property aboard. About 70 classmates and wives arrived during the afternoon with the usual "you're looking swell, glad to see you again, how many grandchildren this time, what trips have you been on lately, and how are you enjoying retirement?" The original list sent out on May 12 had been increased by 50 per cent with only a very few cancellations. The attendance was all that we could expect. In general the program included a seafood dinner and Monte Carlo night on Thursday (Bob Tonon had manufactured and brought along 10,000 half-dollar-size aluminum discs for the Monte Carlo, blackjack, and dice games.) The contests started on Friday with golf, horseshoes, tennis, putting and bridge. After

the delicious lobster dinner Friday night Oscar Horovitz showed several of his prize winning movies. A film entitled The 104 dealing with the Pilgrims in Plymouth had been selected by the Victorian Amateur Cine Society of Melbourne, Australia, as one of the five best films in 1966. Oscar expects to later show his film The Tourist's Russia, another prize winning effort with his delicate touch of an accomplished professional. An anxious hour occurred before the dinner when Jimmy Duane failed to show up with the lobsters and clams as promised. He was delayed by a flat tire and had to remove all of the crates and boxes containing our delicious food to get to the spare tire.

On Saturday, June 10, the games were continued, trips around the Cape were enjoyed by many and the weatherman was thoroughly co-operative with a lovely, sunny, breezy day. At the banquet Saturday night President and Mrs. Howard Johnson dropped in for cocktails on their way to the class having their 50th at Chatham Bars Inn, about 20 miles beyond Osterville and Wianno. Howard and Betty are delightful to know and easy to entertain. It was most pleasant to have an informal visit with this charming couple. The roast beef and mince pie Reunion banquet was beautifully served during which Fearing Pratt continued to supplement the Class records with movies (Fearing is now the official Class Photographer). He followed the activities diligently. President Parke, in a ten minute speech, brought us up to date on the accomplishments of individuals in the Class and called on help to provide the prizes for the tournaments of the past two days. Parke was presented with a Gorham sterling silver serving tray and Madeline was awarded a gold charm bracelet with miniature cranberry rake, Boston cod and a lobster

Sunday was a beautiful day for visiting and continuing entertainment on the tennis courts by Frank Kurtz, Sam Vadner, John Vaupel and Randy Myer. After lunch we all drove up through Plymouth and met again at McCormick Hall. There Don Carpenter and Bill Russell, both of whom had been at their Andover 50th, helped carry in the luggage to our delightful quarters. That evening we had a cocktail party in the roof studio at McCormick and a buffet dinner in the first floor dining room. Entertainment was provided by the Institute in the adjoining lounge consisting of the unique Los Pepes (folk musicians) direct from Mexico. They had come down from Expo 67 to provide entertainment through the courtesy of the Mexican government. After the Mexican songs we went to the auditorium to see and hear the colorful filmed travelogue Rivers of Fire and Ice by Ronald E. Shanin, '42. This film was produced over a period of a two-year visit to Africa, showed the life of the people and the spectacular effects of the volcano eruptions, the lion, snake and river life and the mountain glaciers. On Monday we followed the usual Alumni Day program of seminar sessions in

the morning and afternoon. The alumni luncheon was in the Great Court at noon, the champagne social held in the Stratton Institute Center (moved inside because of extremely heavy rain), the usual banquet and visiting in the Field House and evening entertainment in Kresge Auditorium by the Mariachis, an exciting young a capella choir and a rollicking banjo band. Then came the big dance to the festive music of Rudy Newman's orchestra. And on Tuesday everyone went back to work, or continued play or retirement.

Concerning those attending the 45th Reunion at Wianno and/or M.I.T., the Institute listing included: Park and Mrs. Appel, J. Cecil and Mrs. Aronson, Edward and Mrs. Ash, C. Ford Blanchard, Charles E. Brokaw, Donald F. Carpenter. Lee W. Carroll, Yardley and Mrs. Chittick, Paul and Mrs. Choquette, Saul and Mrs. Copellman, Theodore and Mrs. Elliott, Warren T. Ferguson, Whitworth and Mrs. Ferguson, Morris H. and Mrs. Gens, Lawrence and Mrs. Gentlemen, Chester and Mrs. Greening, John F. Halpin, Ray Hewes, Oscar and Mrs. Horovitz, Abbott L. Johnson, Edward and Mrs. Keane, Harold and Mrs. Koch, Francis M. Kurtz, Lester and Mrs. Lewis, Julian Lovejoy, Horace and Mrs. Mc-Curdy, Milton and Mrs. Manshel, Theodore and Mrs. Miller, William and Mrs. Mueser, C. Randolph and Mrs. Myer, Edward and Mrs. O'Connor, Marjorie Pierce, Winthrop and Mrs. Potter, Fearing Pratt, Samuel and Mrs. Reynolds, B. M. Rivkin, William and Mrs. Russell, Elmer and Mrs. Sanborn, Roscoe Sherbrooke, Hugh Shirey, Francis and Mrs. Spalding, Dale and Mrs. Spoor, Florence W. Stiles, Kenneth R. Sutherland, Earl and Mrs. Thomas, Wilfrid and Mrs. Thomson, John and Mrs. Vaupel, Vernon and Mrs. Whitman, Frank and Mrs. Wood, Charles and Mrs. Williams. . . . Our Class of '22 Professor, John Wulff, wrote his regrets lamenting his conflict of engagements with an important invitation to lecture in Europe. Professor Wulff thanked the Class for the endowed chair as having given him the happiest time of his life at M.I.T. thus far. He said: "It gave me an opportunity to concentrate on one freshman class and one sophomore class every year along with a sizeable freshman laboratory research seminar. I trust the 100 or more students per year I met in this work enjoyed it as much as I did. In any case, I shall be forever grateful for the chance you have given me to do this work as the Class of 1922 Professor. Eva joins me in sending all of you our best regards. All good wishes for sunny weather and a successful Reunion!"... In regretting his inability to attend our Classmate Y. Chatani from Tokyo forwarded six packs of slide pictures of Japan with goodwill greetings.

You will all be interested to learn that our active athletes were awarded prizes for their special abilities. For tennis singles, Sam Vadner and Frank Kurtz took first and second; the doubles tournament was won by Randy Myer and Bob Loss; the first honor in horseshoes went to Mac McCurdy, second to Frank

Russell of Needham. The prizes for winning games-of-chance on Las Vegas night went to Joe Greenblatt, Saul Copellman, Joan Appel, Mrs. Edward Ash and Mrs. Willis Stose. Three winners in the men's bridge were Ed Ash, Keith Robbins and Lester Lewis. Appropriate ladies prizes were received by Mrs. Charles Whittum, Mrs. Sam Vadner and Mrs. Harold Stanley, Mrs. Parke Appel won the compote for croquet, a smashing victory!... The golfers were made happy by the excellent club golf course, playing their usual brilliant game with slightly above par scores. The awards were made as follows: for low gross, Larry Davis and Hugh Shirey; for low net, Jack Molinar, Bob Tonon and Chuck Brokaw; Charles Tyson from New Jersey was nearest the ninth hole flag: Sam Reynolds won the Friday's kicker and Ev Vilett won Saturday's, Friday's putting prize went to Whit Ferguson and Saturday's prize to Harold Stanley. The ladies prizes were awarded to Mrs. Ash for low gross and Mrs. Vilett for low net. The putting awards were made to Mrs. Loss, Mrs. John Hennessy and Mrs. Steve Neiley (of the neighboring community of West Dennis). Yard Chittick was given the prize for the most descendants at M.I.T. and seven others had one each. Jimmy Duane received the highest award for providing the most lobsters and Oscar Horovitz was honored as the most famous photographer. Katharine Mc-Curdy was voted to have come the greatest distance and Mrs. Harold Koch from Wisconsin received a memento for having the most grandchildren (11). More thanks are due the prize committees and those in charge of the various activities including Bill Mueser in charge of putting and Dale Spoor and Katherine for the bridge tournaments.

During Friday's Class meeting a report was received and accepted of the nominating committee for Class officers for the next five years leading to our 50th Reunion. They are: Parke D. Appel, President and 50th Reunion Chairman; Donald F. Carpenter, Senior Vice President and Estate and Reunion Gift Chairman; C. Yardley Chittick, Vice President for New England; William H. Mueser, Vice President for Middle Atlantic; Dale D. Spoor, Vice President for South Atlantic; Francis M. Kurtz, Vice President for Florida; Francis W. Spalding, Vice President for Midwest: Charles E. Brokaw. Vice President for Mountain States; Horace W. McCurdy, Vice President for Pacific Coast; Whitworth Ferguson, Secretary; Oscar H. Horovitz, Assistant Secretary; Everett W. Vilett, Treasurer; Warren T. Ferguson, Assistant Treasurer; Dale D. Spoor, Class Agent. A motion was made and adopted electing a 50th Reunion Committee of the following: C. George Dandrow, Laurence B. Davis, Abbott L. Johnson, Harold E. Koch, Theodore T. Miller, Hugh M. Shirey, Robert Tonon, L. Samuel Vadner.

This report concerning the 45th Reunion of the interesting and active Class of 1922 does not include the lively stories told at the event, nor the challenges posed by our friendly classmates. We

should itemize herein the many personal experiences and reminiscenses exchanged during these exciting days in June. Notes could include reports about families and grandchildren, their progress and bright quotations. And it will all happen again during the following June Reunions at the Institute and especially at our 50th at the Wianno Club. You may look forward to more items on current status and reports on letters received in the next issue. A healthful and happy fall season to you! Whitworth Ferguson, Secretary, 333 Ellicott Street Buffalo, New York 14203; Oscar Horovitz, Assistant Secretary. 33 Island Street, Boston, Mass. 02119

23

The following information has been received in response to your Secretary's letter of May 15, 1967, to all classmates: John Valli Janes is Vice President and Treasurer of Petrolite Corporation, 408 Pine St., St. Louis, Mo. 53102, and has four children and 13 grandchildren; Gerald A. Fitzgerald, a Professor, University of Massachusetts, Amherst, Mass., is interested in the physical distribution of grocery products and has three children and three grandchildren; Albert S. Redway is retired and has two children and six grandchildren: J. Curtis Willson. 1725 Tiverton Road, Bloomfield Hills, Mich. 48013, is retired and has four children and 13 grandchildren; Philip L. Coleman is Vice President, Duff and Phelps, Inc., 208 S. LaSalle St., Chicago. III. 60604; William L. Barday, Island Drive, Rye, N.Y. 10580 is consultant, Louis T. Klander and Associates, Philadelphia National Bank Bldg., Philadelphia, Pa., and has two children and six grandchildren; James A. Pennypacker is retired but is working in Santa Monica with the Rand Corporation and has three children and seven grandchildren; Henry F. Culver, 2500 N.E. 48th Lane, Ft. Lauderdale, Fla. 33308, is retired, and has two children and eight grandchildren; Rodney M. Goetchins, General Manager (Retired), Western Electric Company, is Vice President and Director of Complan Associates, a new consulting firm for communications planning of which Charles M. Mapes is President. Rodney reports that he and his wife returned from a 30-day visit to Santiago, Chile, in May. He and an associate made a survey of the operations of the Chilean Telephone Company. His firm is also active in a project in Taiwan and one in Jordan. He is interested in golf and bridge and has two children and six grandchildren; Cdr. Julian S. Loewus reported in May that he had just arrived home after an absence of two weeks in Hot Springs, Ark., where he takes the baths twice a year for arthritis. He says, "Sorry I can't get to the Reunion-give all the boys my best regards. We plan a trip to the Grand Canyon this summer. I had promised my wife and daughter to go when she was 12 so she could ride the donkey down the slope to the bottom." Edmund A. Miller, Chairman, Rochester Furniture Crafts Guild, Inc., reports that he is interested in simple basic definition and

explication, and enjoying life with gratitude! H. F. Marshall reports that he is unemployed. Sold Marshall Oil Company to Humble and quit. He has one child and three grandchildren. Archibald Williams is Vice President, Emhart Corporation, Cottage Grove Ave., Bloomfield, Conn. He reports his interests as home, grandchildren, photography and expects to retire at the end of the year in order to have more time for above! Looking forward to the 45th. He has two children and six grandchildren. John B. Nason, Jr., is retired and reports one child and two grandchildren. David Kaufman is engineer, W. Lepes and Sons, 295 Main Rd., Tiverton, R.I., and reports two children and no grandchildren. Myles Morgan is Chairman, Morgan Construction Company, 15 Belmont St., Worcester, Mass. 01605, and reports four children and 12 grandchildren. D. H. Alexander, 118 Palmers Hill Rd., Stamford, Conn. 06902, reports that he has retired.

Elliot P. Knight is Chairman, Towle Mfg. Company, 260 Merrimac St., Newburyport, Mass. Herman A. Bruson, Vice President (Retired), Ollin Mathieson Chemical Corporation, New Haven, Conn., reports three children and two grandchildren. Stephen A. Days, Stephen A. Days, Inc., 6 MacArthur Blvd., Bourne, Mass., is retired and reports one child and no grandchildren. Philip C. Smith, Box 13, Melvin Village, N.H. 03850, reports that he has retired from N.Y. Telephone Company, has one child and one grandchild, and has "year round enjoyment of New Hampshire." Newman W. Field is Senior Architect, Office of School Bldgs., Board of Education, 28-11 Bridge Plaza North, L. I. City, N. Y. 11101. E. Louis Greenblatt reports that he has retired. Philip S. Wadsworth is President, Wadsworth-Boston-Dimick-Mercer and Weatherill, 201 Congress Bldg. Portland, Maine. Howard F. Russell is retired and reports one child and one grandchild with "ham" radio, color photography and travel as special interests. Bertrand A. McKittrick, Chairman of the Board, Frank G. W McKittrick Company, reports one child and four grandchildren. Hugh S. Ferguson is retired and reports two children and five grandchildren. Hamilton J. Bickford is retired, reports that he has been totally disabled by arthritis since 1962 and has four children and seven grandchildren. (See report of death received subsequent to receipt of this information.) Sherwood I. Berger is retired and reports two children and two grandchildren. Harold H. Leary, President, Leary's Cleantown, Rochester, N.Y. 14625, reports one child and two grandchildren. William B. Greenough, Jr., Vice President, Whittet Higgins Company, reports three children and nine grandchildren. U. A. Whitaker, Chairman of Board, AMP Incorporated, Box 3608, Harrisburg, Pa. 17105, reports two children and four grandchildren. Horatio L. Bond, Chief Engineer, National Fire Protection Association, has made some helpful suggestions which your Secretary has used. William P. Allis, Professor, M.I.T., Room 26-237, reports that he retires this year but will continue half-time. He also expects to be in England some-

time within the next year. He reports three children. John W. Beretta, President, Beretta, Greenslade & Associates, Inc., 902 Travis Bldg., San Antonio, Texas 78205, reports three children and one grandchild and interest in historical restorations, travel and antique collecting. Louis A. Metz, V.P. Director, Ceco Corporation, is retired, reports two children and four grandchildren. He is interested in golf, skeet, Vice President and Director, Evanston Hospital. Home address is 1296 Hackberry Lane, Winnetka, III. 60093. Arthur W. Davenport reports two children and five grandchildren. Phyllis reports, "Looking forward to being with you on June 6 to 9, with my better half." Address is 109 Bay Drive, Virginia Beach, Va. 23451 (P.O. Box 574).

Walter Dietz is retired (1958), Box 2265, 802 Lakeshore Dr., Delray Beach, Fla. 33444. He reports three children and eight grandchildren and specializing in golf (golf still lousy!) "Looks like you will have the best Reunion yet. It seems well organized. Congratulations! Elsie and I are looking forward to it. William S. La-Londe, Jr., Principal Structural Engineer, Edwards & Keecey, Inc., Engineers and Consultants, 8 Park Place, Newark, N.J., report two children and five grandchildren. "Marion and are celebrating our 40th wedding anniversary this weekend [report was dated May 23, 1967]. Classmate L. H. Poor and Mrs. Poor are giving us a party and classmate J. M. Robbins and Mrs. Robbins will be there. Both Lee and Jim helped above wedding! (Congratulations Bill! Your Secretary and Mrs. Lange will have celebrated our 45th wedding anniversary in August 1967). Basil O. Stewart is retired, reports two sons and five grandchildren (all boys!). His special interests are bird watching, spider hunting, electronics, walking, touring locally, very limited in physical activity. Edward J. Healy is with the Kuljian Corporation, Engineer's and Constructors, 1200 N. Broad St., Philadelphia, Pa., and reports three children and four grandchildren. Walter N. Webster, President, H. K. Webster Company, P.O. Box 8, Lawrence, Mass., reports two children and four grandchildren. Brig. Gen. Willis R. Slaughter, Earlton Rd., RD 2 Box 35I, Havre De Grace, Md. 21078, consultant, Maxson Electronics Corporation, 1101-17th St., Washington, D.C., reports one chlid and four grandchildren, also that he married Elizabeth Bullitt on December 12, 1964. (Congratulations and the best of happiness to both of you, Willis!) J. C. Nowell, Jr., formerly Manager-Engineering, Real Estate and Construction Department, General Electric Company, Schenectady. N. Y., reports three children and four grandchildren. He is now working parttime as a consulting engineer. Pierre F. de Reynier, Sr., Project Engineer (Retired), Texaco Inc., reports two children and seven grandchildren. John W. Sands, International Nickel (Retired) reports two children and five grandchildren, is interested in golf, photography and boating. Norman L. Weiss, 2620 N. Norris Ave., Tucson, Ariz. 85719, Chief Metallurgical Engineer, American Smelting and

Refining Company reports two children and seven grandchildren and expects to retire and start consulting practice October 1, 1967. Royal Sterling, President, Cinder Products Corporation, reported May 25, 1967, that he has been made President of the N. E. Concrete Masonry Association. Myron K. Chandler is retired from the N. E. Telephone & Telegraph Company and reports one child and four grandchildren, and is interested in gardening. Herman Swett is retired, 364 Cliff Drive, Pasadena, Calif. 91107 and reports one child and three grandchildren. Walter E. Richards, Colonel, USAF, Retired, reports one child and no grandchildren. Robert H. Henderson, American Telephone & Telegram, Retired. reports two children and five grandchildren. He is active in Summit, N. J., Old Guard, drive for Red Cross, and on Church Board, travels a good bit, dabbles in photography and works in the garden.

Richard H. Frazier, Professor Emeritus. M. I. T., Room 3-401, 77 Massachusetts Ave., Cambridge, Mass. 02139, reports two children and no grandchildren. Says he "retired" two years ago and has not had time to sit down since. Wilson Potter, Jr., Col. U.S. A., Retired, reports three children and two grandchildren. Edwin H. Schmitz, Executive Vice President, the Union Fork and Hoe Company, 500 Dublin Ave., Columbus, Ohio 43215, reports two children and six grandchildren, is interested in golf and bowling. W. Gordon Huges is retired, reports five children and 17 grandchildren and is interested in collecting shells and antiques. Thomas B. Drew, Professor Chemical Engineering, Room 12-190, M. I. T., reports three children and two grandchildren, goes on Emeritus list July 1, 1967. Charles S. Keevil, Professor of Chemical Engineer., Northeastern University, Boston, Mass., reports one child and seven grandchildren. Erwin G. Schoeffel is retired from Alcoa and reports two children and five grandchildren. Kenneth C. Kingsley, President, Kingsley Manufacturing Company, reports two children and five grandchildren. In his letter he says, "In prior years I have always had bad conflicts on our five-year reunions which have prevented my being there. Will hope next year may be different." (Your Secretary suggests that all classmates and their wives give the M. I. T. Class of 1923 45th Reunion similar special consideration, break away from the routines of life, and decide to enjoy life with many of their classmates at the Oyster Harbor Club on beautiful Cape Cod, June 6-9, 1968.) Kenneth goes on to say, "We have just returned from our annual trip. This year we went to Australia, New Zealand, Fiji, Samoa and Tahiti. Next year we hope to see the Greek Isles, Spain and Portugal, so possibly we can arrange this so we can stop at Boston on our way home. Last year while we were in the Orient we enjoyed spending some time with P. Y. Tang in Hong Kong and Prasob Sukhum (PHRA BISAL SUKHUMVID) in Bangkok. Earle A. Griswold, Consultant and Director and Executive Vice President of Tampax Incorporated reports three children and 12 grandchildren.



Professor Nathaniel H. Frank, '23, of M.I.T. speaks as a member of the panel on the "Marshalling of Human Resources In View of the Population Explosion."

Plans to build a house in Rye, N. H., this summer (1967). Herbert L. Hayden, retired Du Pont executive reports three children and 11 grandchildren. Plays competitive tennis (rating in New England Senior Circuit). Still plays ice hockey. Other hobbies are photography, bridge and travel. Fred A. Travers, Financial Vice President, American United Life Insurance Company, 30 W. Fall Creek Parkway, Indianapolis, Ind., reports no children or grandchildren. Recently named a trustee of Marian College, Indianapolis. "Look forward to seeing you again; enjoyed the 40th at Chatham Bars. Alfred E. Perlman, President, New York Central System, 230 Park Avenue, New York, reports three children and two grandchildren. Harold C. Pearson, President, Canadian Consociates, Limited, 88 Eglinton Ave., E., Toronto 12, Ontario, Canada, reports two children and six grandchildren. Also says, "Glad to know that someone is working on the 45th. I appear to be "going along for the ride! I hope to see you at the Institute on June 12th."

Arne Lier, Chief Structural Engineer, the Port of New York Authority, 111 8th Ave., Room 1115, New York, N. Y. 10011, reports two children and one grandchild, also that he received the award: Metropolitan (New York) Civil Engineer of the year (1966). Charles M. Mapes reports three children and no grandchildren, also that he retired from A.T.&T. Co. to form his own consulting firm, Complan Associates, Inc., of which he is President. Howard A. Lockhart is retired, reports three children and four grandchildren and that he is really enjoying retirement. W. G. Blake is retired and reports one child and four grandchildren. Charles H. Ducote, International Industrial Consultant, reports one child and five grandchildren. Alexander C. Stewart is retired and reports two children and three grandchildren. New address is: RR#3, Waldoboro, Maine 04572. Marvin Eickenroht, FAIA, Architect, 702 Maverick Bldg., San Antonio, Texas 78205, reports two children and two grandchildren and is interested in historic preservation. John J. Murphy is retired and reports four children and 16 grandchildren. Miles Pennybacker, Chairman of the Board, Voltarc Tubes, Inc., Box 688, Fairfield, Conn. 06433, reports three children and six grandchildren. George W. Bricker, U.S./AID Karachi, APO New York 09271, reports two children and seven grandchildren and

says, "Still enjoying South Asia in spite of frustrations. Still operating as Chief Technical Advisor to the Investment Advisor Center of Pakistan maybe for another two years." Frederick O. A Almquist, Project Engineer, Camp Dresser and McKee, One Center Plaza, Boston, Mass., reports four children and 11 grandchildren, also that he retired from State (Conn.) Health Department in 1964, spent 15 months in East Pakistan, back to Boston and Hartford. Wife deceased in 1965. Paul B. Brown reports that he has retired. Robert E. Hendrie, Consulting Engineer, retired from New England Telephone & Telegraph Company in 1961, now works on consulting basis. Benjamin P. Lane reports two children and four grandchildren and that he retired from Joy Mfg. Company on March 31, 1967. His new address is Box 334B, RR#1, Orleans, Mass. 02653. Kenneth S. Andem reports three children and eight grandchildren and that he is retired form American Can Company, San Francisco, Calif. Columbus E. Lord reports two children and two grandchildren and that he retired from Office of Assistant Secretary of Defense (Installations and Logistics) April 30, 1967. David B. Joy reports two children and four grandchildren, that he is retired from Union Carbide, and that his interests include Stock Market, swimming, fishing, Board of Health, and loafing.

Geophysical Service Inc., Texas Instruments Inc., P.O. Box 5621 (6000 Lemmon) Dallas, Texas 75222, held the 17th Annual Earth Sciences Orientation Conference of its Student Cooperative Plan in June 13-16. Lectures by administrative and technical leaders in industry, government and the academic world provides a comprehensive introduction to the earth sciences as a profession for 35 top students from 20 U.S. colleges. Subsequently, the student gained practical experience through summer employment in GSI. Detailed information on the GSI Student Cooperative Plan will be found in Geotimes Vol. 11, No. 5, December 1966. This Student Cooperative Plan was originated in 1951 by Cecil H. Green, Honorary Board Chairman of GSI, and Dr. Robert R. Shrock of the Department of Geology and Geophysics of M. I. T. P. Y. Tang, 501 Edinburgh House, Hong Kong, reports seven children and 13 grandchildren. He is a member of the legislative council and was recently awarded Officer of the Order of British Empire. He is interested in swimming and he is Chairman, South Sea Textile Mfg. Company Ltd. Harry Kalker reports three children and six grandchildren, has been on a three months European trip and ran across Harry Green in London. He is Retiring out of Sprague Products Company, North Adams, Mass., as President and into life insurance business as Chairman of the Board of the Great Eastern Life Insurance Company he formed in 1959. Charles F. Schell reports that on March 18, 1967, his son William was married to Miss Linda Ruth Mueller at Marsh Chapel in Boston University. On March 31 he retired after 43 years at the Braintree Plant of the Armstrong Cork Company.

On May 28 his son and his wife both graduated from Boston University. On June 5 his son was commissioned as Ensign, U.S. Naval Reserve. He says, "I have no special plans for the immediate future, but expect to indulge in my hobbies of philately, marine photography and gardening. Peter Petersen, President, Giertsen & Company, A/S, Slottsgt 3, Bergen, Norway, reports three children and no grandchildren. Harry Green reports three children and four grandchildren and that he met Harry Kalker in London. Edward S. Averell reports three children and three grandchildren and probably more at reunion time, and is retired. Francis Leo Cronin is retired at the Fountainhead, 3900 Ocean Drive, Lauderdale by the Sea, Fla. 33308, Joel Y. Lund, retired, reports two children and two grandchildren. Parker B. Holden is retired and reports two children and six grandchildren. Joseph Fleischer, President, Certified Pest Control Company, Inc., 33 Highland Ave., Needham, Mass. 02194, reports two children and six grandchildren and interest in golf and loafing. He says, "My two sons Aaron and David, who attended our 25th Class Reunion, are now operating my company in Needham and Lynn Mass., and Providence, R. I. I have virtually retired and will live in Hollywood, Fla., nine months of the year. Frederic S. Mann, retired from New England Telephone & Telegraph after 44 years, last ten years served as General Traffic Supervisor. Frank J. Travers, Vice President and Director of American United Life Insurance Company, has been named to the Marian College Board of Trustees. He is a Charter Member of the Marian College Advisory Borad which was founded in 1957 and has participated in all development planning at the college. A past President of the Indianapolis Society of Financial Analysts, he has served as Chairman of several national life insurance trade associations.

Julius A. Stratton, Chairman of the Board of Trustees of the Ford Foundation. was presented with the Silver Stein Award of the M. I. T. Alumni Center of New York at a dinner at the Plaza Hotel Thursday night, June 1. The presentation was made by the late Thomas D'Arcy Brophy, '16, former life member of the M.I.T. Corporation who had once received the award. President Howard W. Johnson of M.I.T. was the principal speaker. James R. Killian, Jr., Chairman of the M.I.T. Corporation, brought greetings from the Corporation. The inscription on the Silver Stein stated his "inspiring leadership for 40 years as teacher, administrator and President strengthened and enriched beyond measure his Alma Mater." He reports three children and no grandchildren. The Barden Corporation, in May, announced the retirement of Vice President, Chief Engineer, Thomas E. Rounds. He joined Barden as Senior Executive Engineer in 1943, a few months after the company was established in Danbury as a World War II supplier of precision bearings for the Norden bombsight. In 1946 he was made Chief Engineer, and in 1956 was elected a Vice President of the company. He has also

served the Barden bearing subsidiary in Bracknell, England, as consulting engineer and director. In addition Mr. Rounds has been Secretary of the Instrument Precision Ball Bearing Section of the American Ordnance Association, Chairman of the Annular Bearing Engineers' Committee of the Anti-Friction Bearing Manufacturers Association, Chairman of the Committee on instrument bearings of the U.S.A. Standards Institute, and official representative of that organization as Chairman of the working group on instrument bearing of the International Standards Organization. He is a member of the American Society of Mechanical Engineers and was the first president of the Danbury Engineering Society. As an authority on bearing design and application, he has contributed articles to various technical journals. A registered professional engineer, Mr. Rounds is continuing his activities as a consulting engineer in the field of ball and roller bearing application. Mr. Rounds is active in civic affairs in Danbury. He served as Chairman of the Citizens Committee on Education, has been a vice president of the Mid-Fairfield Council of the Boy Scouts of America, and is a member of Danbury Rotary. He is Chairman of the building committee of the First Congregational Church. In recognition of his long and valued service to the company and his leadership in the field of precision bearing development, Barden officials and associates gave a dinner in his honor at Fox Hill, Ridgefield. Mr. and Mrs. Rounds reside at 25 Ridge Road, Danbury, Conn. 06810. Charles V. Reeves, 1243 Kutz Road, McLean, Va. 22101, reports that he retired in 1965 with his permanent home in Virginia. Gerald A. Fitzgerald reports, "Still active at the University of Massachusetts, Professor of Food Engineering, research in physical distribution and packaging, having fun! Wish the 1923 boys the same!" Frank S. Archer, 28 Lake Shore Blvd., Reddendale, Kingston, Ontario, Canada 9CAON, reports, "66 years young, President, Archer Pumps Limited." Edurado Icaza A., Box 532 Panama, Republic of Panama, partner in Icaza and Company, Ltd., reports four children and 15 grandchildren. Arthur R. Belyea is retired and reports two children and seven grandchildren. Ray Holden is retired, reports two children and three grandchildren and is enjoying the luxury of retired living in Florida. Edward McSweeney reported in August, 'We recently returned from a lengthy European business trip including a week in Bulgaria, our first visit to an Iron Curtain country. There is a saying in Europe that goes something like this: 'Anyone who has spent a week behind the Iron Curtain is as much an expert as he ever will be.' So on that basis we qualify! The question most frequently asked has been, 'What led up to your go-ing to Bulgaria?' Last fall our State Department raised Bulgaria from a ministry to an embassy. My cousin, John Mc-Sweeney, a career diplomat who had served twice in Russia, was appointed our Ambassador to Bulgaria. When he was home on leave with his family he invited us to visit them in Sofia, and we accepted.

When I was offered, and accepted, a business assignment in Vienna, I learned that Austrian Airlines had a non-stop flight from Vienna to Sofia. About that time we came across a delightful book written by Ilka Chase which told about a trip that she had taken with her husband through the Balkan countries, and we were sold." Ed then gives an interesting and lengthy account of their trip which took them to the Golden Beach at Varna on the Black Sea, Nesebur and Burgas, a seven-hour drive over the mountains to Solonika, and to Athens via an Olympic Airline plane. Ed says, "Many people refer to Bulgaria as the country where East meets West'; and on the Golden Beach that is particularly true because it is here that many families from West Germany meet their relatives from East Germany. This is one of the few places in the world where this happy event is possible." There is an interesting article in *Printing News*, June 24, 1967, by Ed entitled, "Some Impressions of DRUPA." It begins," To do justice to the size of DRUPA '67, you really should reach back and borrow some of the Hollywood adjectives like 'colossal', 'stupendous', and 'gigantic.' Nearly a thousand exhibitors showed and demonstrated their products." An editor's note says Mr. McSweeney continues a tradition established in former years with his 'First with the News' coverage for this publication of the famed graphic arts expositions held in Europe, including not only the previous DRUPA exposition in Duesseldorf, but also IPEX in London and TPG in Paris. Mr. McSweeney has long been associated with the graphic arts industry and is well-known for his many years of leadership in developing programs for education and training in management techniques. Among his many other achievements, he was last year's recipient of the William H. and Harry J. Friedman Memorial Award."

Alcott H. Hooper, Vershire, Vt. 05079, Consulting Engineer, Stone & Webster Engineering Coropration, expects his postponed retirement to end by December 1967. He reports five children and 14 grandchildren. He says, "I've been in Turkey since April on a consulting assignment that involved visiting some 20 or more dam sites for power development and selecting those to be built in the next five year plan and the sequence of some to follow thereafter. On completion of our report and another short trip to Turkey this fall, my sixth since 1948, I'll retire and look forward to our Reunion date. Bertram E. Warren, an authority on the use of X-rays to probe the structure of matter, retired June 30 after 47 years at M. I. T. as a student and professor. A professor emeritus, Dr. Warren will continue teaching and research on a part-time basis this summer and fall, and next January will go to Paris, France, under a Fulbright grant to lecture at College du France for six months. Milton E. Parker, RR 2, Box 105, Barrington, III., has registered for attendance at the 1967 National Alumni Officer's Conference in San Francisco, Calif., on September 29-30, . . . "Married in Virginia were Mrs. Harold E. Lobdell of

Mexico City, widow of the late Dean Lobdell of M.I.T., and Harold C. Pearson of Toronto, Canada, President of Canadian Consociates Limited." The Boston Herald Traveler of July 12, 1967, continued, "The marriage took place at the church of St. Francis in Staunton, Va., June 26, and afterwards the bridal party was entertained at Buxton Farm, the Virginia home of Mr. and Mrs. Edward Pennell Brooks of Boston. Mr. and Mrs. Pearson will divide their time between Mexico City and Toronto." . . . Richard C. Kleinberger, Registered Professional Engineer (N. Y., Conn., and N. J.) reports one child and two grandchildren, is interested in ham radio and photography. "I took the first vacation in three years in May, and the wife and I had a terrific time exploring the British Isles for three weeks. Among other things we were given the full red carpet treatment by various radio hams that I have talked to on the air for years but had never met before." He expects to attend the 45th Reunion next June. Atherton Thomas, Assistant to Administrative Vice President, Consolidated Edison, 4 Irving Place, New York, N. Y. 10003, reports two children and seven grandchildren. Miss Marion E. Warner, 9162 Edmonston Road, Apt. 304, Greenbelt, Md. 20770, reports, "I am indebted to you and the Class of 1923 for announcements about reunions and for other information about M. I. T. My association with M. I. T. was very pleasant and I am proud of it, but I believe that it was too brief to warrant an alumna rating." Mrs. Ida B. Webster, Partner, Edelbaum & Webster, Architects, 501 Madison Ave., New York, N. Y. 10022, reports two children and five grandchildren. Doing public housing projects for N. Y. C. and state, registered NCARB, member AIA, Director and Executive Committee, Citizens Housing and Planning Council. Roger Cutting reports one child and two grandchildren, is interested in antique cars. He is a Trustee and Consulting Engineer and announces his new business address as 31 Milk Street, Boston, Mass. 02109. Everett C. Brown, Vice President, Cheatham Electric Switch Dev. Company reports two children and two grandchildren.

The following were on hand on Alumni Day at M.I.T., June 12, 1967: Mr. and Mrs. Herbert L. Hayden, Mr. and Mrs. Horatio L. Bond, Mr. and Mrs. Thomas B. Drew and a guest, Mr. and Mrs. Joseph Fleischer, Professor Nathaniel H. Frank, Room 20C-223, M.I.T., who was a member of a panel on the "Marshalling of Human Resources in View of the Population Explosion." Professor Frank, former head of the Department of Physics, is now involved in restructioning the nations high school and college curricula. He made a proposal for a radical departure in training the young for their place in industry. He proposed "transitional" institutions between high school and the job market "to provide a multiplicity of career preparation programs, available to a broad spectrum of people from those of limited capacity to those of great talent and for an age range from the early school dropout to adults in need of

training." Professor Frank reports one child and no grandchildren. Included in these notes is a picture taken by your Secretary of Professor Frank at one of the panel sessions on Alumni Day. Also at Alumni Day: Louis E. Greenblatt and sister Mrs. Ida G. Golden, David Kaufman, Mr. and Mrs. Forrest F. Lange, Elliot P. Knight, Mr. and Mrs. Howard A. Lockhart and daughter Miss Helen L. Lockhart, Harold C. Pearson, Mr. and Mrs. Howard F. Russell, Mr. and Mrs. David W. Skinner, Dr. and Mrs. Julius A. Stratton, Miss Dorothy W. Weeks, George A. Johnson, Lew Tremaine, Joseph Nissen. Mr. and Mrs. Joseph C. Nowell were registered but your Secretary did not see them. . . . Mail sent to the following relative to our 45th Class Reunion in 1968 has been returned to your Secretary unopened from the following classmates. If any classmate has any information on the location of these classmates, please notify your Secretary as soon as practicable: Charles T. Grant, Henry N. Landis, Lew L. Harr, Edwin R. Richards, Arthur H. Earle, Brig. Gen. R. P. Ovenshine, William E. Otis, Ernest J. C. Simonson, Frederick H. Brewer, Kilburn M. Smith, Raphael S. Chavin, Felipe Diaz Ossa.

A nephew, Mr. W. F. Grady, 112 Perham St., West Roxbury, Mass., reports that our classmate James J. Moran passed away in 1958. No details were given. Word has been received from the Alumni Office, with no further details, of the deaths of: William Stevenson, 1264 Wood Valley Road, W. Mountainside, N. J., on May 7, 1967. He was an engineer for 35 years with the New York Telephone Company before his retirement in 1965 and a member of the Borough Council here nine years. Mail to Lawrence E. Duane, 23 Columbus Ave., Beverly, Mass. 01915, was returned by Post Office marked "Deceased" with no details; mail to Professor Henry M. Kendall, Tallawanda Apts. 9, High St., Oxford, Ohio 45056, was received, but the information form was returned saying, "Dr. Henry Madison Kendall died January 13, 1967," with no details; Robert J. Hull's mail was returned marked "Deceased", with no details - possibly previously reported; John P. Nissen, Jr., Box 153 Church Road, Wyncote, Pa., died on March 11, 1967; although probably previously reported, Howard B. Keppel, Jr., died July 19, 1965. . . . Word has been received of the death of Hamilton Judson Bickford, on July 13, 1967, at the Adams House Convalescent Hospital in Farmington, Conn. He was born on Staten Island, N. Y. He graduated from the Phillips Exeter Academy at Exeter, N. H., in 1919. After receiving his degree in mechanical engineering from M.I.T., he worked for the Stanley Rule and Level Company in New Britain until 1929 when he joined the staff at the Cherry Brothers Mills in Manchester. He moved to Broadalbin, N. Y., in 1956 and was employed in the manufacture of fiber glass products in Amsterdam, N. Y., until forced to give up work because of ill health about five years ago. He leaves his wife Mrs. Mary Vaill Bickford; four sons, John A. Bickford of Middletown, Dudley V. Bickford of Berlin, Thomas Bickford of Baltimore,

Md., and James Bickford of Colebrook; two brothers, Atty. Albert C. Bickford of Ardsley-on-Hudson, N. Y., and Joseph C. Bickford of Pelham, N. Y.; a sister, Miss Elizabeth Bickford of Bronxville, N. Y. and seven grandchildren. . . . Henry N. Landis, 4462 Parklane Court, Birmingham, Mich. 48008, died on April 28, 1967; James E. Brackett (no address given) on July 29, 1967.

The Alumni Office has advised of the following changes of address: Fred A. Travers, 7409 N. Pennsylvania St., Indianapolis, Ind. 46240; Herman Swett, 364 Cliff Drive, Pasadena, Calif. 91107; Benjamin P. Lane, Box 334-B, RR #1, Orleans, Mass. 02653; Edwin J. Heap, Eastern Ave., Harwichport, Mass. 02646; John A. Thompson, 216 Pleasant Valley Ave., Moorestown, N. J. 08057; Professor John E. Burchard, 564 Springs Road, Bedford, Mass. 01730; Cecil A. Green, Geophysical Service, Inc., Box S474, Dallas, Texas 75222; Setrag Sulahian, 11 Adams Court, Rockeville Centre, N. Y. 11570: Henry Flynn, 4001 Memorial Blvd., Apt. 124, Port Arthur, Texas 77640; George H. Hurley, Rt. 2, Box 244, Burlington, Wisc. 53105; William Wolfe, 40 Imrie St., Randolph, Mass. 02368; Bernard F. Flynn, 2532 E. 49th St., Vernon, Calif. 90058; William B. Gurney, 1439 Arlington Ave., Baton Rouge, La. 70808; Maxwell B. Donald, Rabbit Shaw, Stagbury Ave., Chipstead Surrey, England CR3-3 PaEng.; Clifford P. Swaine, Box 41, So. Hamilton, Mass. 01982; Miss R. M. Karapetoff Cobb, 47 Grozier Road, Cambridge, Mass. 02138; Lew L. Harr, Jordan's Landing Road, Murrells Inlet, S. C. 29376; Miss Marion E. Warner (was Mrs. Marion Warner Hovey), Apt. 304, 9162 Edmonston Road, Greenbelt, Md. 20770.-Forrest F. Lange, Secretary, 1196 Woodbury Ave., Portsmouth, N. H. 03801; Bertrand A. McKittrick, Assistant Secretary, 78 Fletcher Street, Lowell, Mass. 10852

24

"It is with sincere affection that we welcome the incoming Class of 1924. We recognize in you the possibilities of becoming good Tech men with all the responsibilities which that name implies." So read the opening words of the lead editorial in The Tech for October 2, 1920. Whoever wrote those stirring words, probably Editor-in-Chief Cac Clarke '21, must have had a certain amount of prescience. There had been little chance for him to recognize anything in us, since we hadn't even registered at that time. However, we all admitted that the writer was a man of keen perception. There were 700 of us in the fall of 1920. We were soon overwhelmed with attention from all directions: pitchmen from VooDoo, T.E.N., and The Tech; recruiters for Field Day teams, soccer, crew, and track; exhorters from the musical clubs, Cosmopolitan Club, Chess Club, and TCA. And, of course, roving press gangs of sharp-eyed brothers bent on cutting out the sheep from the goats. It hardly seemed as though there would be enough time for study. For some,

there wasn't. The beginning of the second term saw our ranks considerably thinned. Was that really almost half a century ago? Maybe it will seem much longer to some of you. So what are we doing today, the start of the 48th year since the Class of 1924 came into being? Primarily, it seems, retiring is the thing. Mark Sinnicks spent 25 years as a civilian engineer at the Naval Air Station in Alameda, Calif. Now he's enjoying retirement by shuttling back and forth between his home in Oakland and a summer place in the High Sierras, and now and then a trip to Alaska or Yosemite for variety. . . . Paul Miller headed for Florida. He's living in Fort Lauderdale. . . . After 42 years with Commonwealth Edison in Chicago, Earle Wild retired last spring. He had the title of Executive Assistant at the time. . . . Boynton J. Fletcher relinquished the title of Vice President in charge of engineering and purchasing for Aluminum Company of America in May. From the picture accompanying the press release his hair is not quite as curly as it once was, but at least he still has it.

Two M. I. T. Faculty members retired in June as we have previously reported, Alex Bone as Associate Professor of Civil Engineering, Harold Hazen as Dean of the Graduate School. As a farewell present Harold's staff gave him a sun dial, no doubt symbolizing the slower pace he has ahead. Actually he will not spend all his daylight hours sitting in his Belmont yard watching the hours creep by. He has taken on the post of Foreign Study Advisor. This is no empty title. This year, for the first time, students with approved overseas programs will be listed officially as "M.I.T. students registered for foreign study." . . . Retiree Bill Van Dunsen didn't go all the way South, only as far as Easton, Md. He probably likes the boating in Chesapeake Bay. Nate Schooler hasn't really retired, but he's stepped himself up to Chairman of the Board and is letting son Jerry run Flush Metal. So Nate and Freda now have more time for travel as they did last summer, journeying to Israel. "Life goes on as usual here. The people are courageous and determined to bring permanent peace to the Middle East soon." . . . Some months ago the N.Y. Times headlined a story, "Sanitation Chief Assails Politics In Department." The head of New York's Sanitation Department, newly appointed at the time, claimed it was the most politically dominated department in the city, and "pledged to uproot lobbying and favoritism, which almost invariably lead to corruption." He started by elevating three "able and honest men" to high positions, the highest of which, First Deputy Commissioner in charge of engineering and planning, went to Henry Liebman. Henry has worked for the city for 36 years. At the time of this appointment he was the department's director of operations. ... Another classmate in the same department, Howard B. Stevens, retired last May. His cohorts threw a big party

The Willard Blaisdells were the victims

of a weird and unsettling experience in May. Will and Hazel were tied and beaten up by burglars, who probably knew what they had come for. Will had a coveted coin collection valued at \$100,000. It went with the burglars. During the robbery Hazel had a seizure, on top of everything else. However, at last reports, after a bit of rest at their summer place they were both in good shape again. No report on the collection, though. . . . We erred in the July notes in stating that Stanley A. Higgins was almost dropped from the Association rolls. Seems he has been a Life Member for more than 30 years. He was the victim of sloppy reporting. Sorry about that. . . . The Clarence Reddens came up from Pennsylvania in June for an excellent reason. Their daughter Martha graduated from M.I.T. This fall she has returned with a teaching fellowship and will work for an advanced degree. ... And the daughter of another Pennsylvanian, Don Moore, is studying in Cambridge this year. Sandra and her brand new husband, Andy Faber, are both at Harvard, she with an NSF fellowship to study astronomy, he a Harvard fellowship in physics. . . . Hank Simonds' son, Charles, graduated from Stanford last June. During the summer he did field geology in the Rockies. Sounds a bit safer than his job as a para-firefighter in Idaho the year before. This fall he is a teaching assistant at the University of Illinois, then wants to get a Ph.D. at Harvard. Three more indications that our class has produced its fair share of bright youngsters.

Harold Young was older than most of us, and he retired several years ago. Since then he and Mrs. Young had traveled extensively. His travels came to a sorry end last spring. Let Hank Simonds tell it. "Harold and his wife were touring Japan. He had just purchased railroad tickets in a station about 50 miles from Tokyo, picked up his two suitcases and started across the floor and collapsed. His wife was immediately behind him and went to his side. She called for help and though hundreds passed by, none would become involved enough to answer her cries in English. She finally left him sprawled out on the floor of the station and went to the ticket office and managed to explain her difficulty to the ticket agent who called an ambulance. The ambulance crew worked over him, but he was gone. The body was cremated in Japan, and the ashes brought home to be buried in Golden Gate Cemetery." . . . As these notes are being written, the morning paper records the fact that Fred Westman, one of our two Class Agents, died on September 14. Fred was an architect, a partner in the Boston firm of Whelan and Westman, specializing in church and school architecture. In May he had written: "Have returned from a holiday in Morocco and Portugal, and am now in the process of catching up." A letter from Gordon Calderwood, '27, tells of the death of Yervant G. Krikorian. A Course II graduate, Yervo joined us as a junior. He stayed in this country until the 30's, then returned home to

Damascus. "Although a native of Syria (the family business, K&K Krikorian, imported the first sewing machines into Syria), Yervant spoke flawless English, French, and presumably Arabic. After he returned to Damascus, for a number of years we were out of touch. A wedding announcement, a visit to Damascus by a friend of ours, and correspondence with Yervant's teenage son, an ardent philatelist, renewed our friendship. Yesterday from Yervant's wife we received news of his unexpected death. Those who remember him may wish to send condolences to his wife, Anahid Krikorian, P.O. Box 322, Damascus, Syria." . . . Two further deaths: David J. Sullivan in Bridgeport, Conn., in July; Louisa E. Norton, a Ph.D. in physics, date unknown. . . . My thanks to Bill Mac-Callum for that unexpected addition to the July notes. Very much appreciated. Came as something of a shock to realize I've been writing these columns for almost 20 years. It's been fun all the way, and of course in retirement it's one more excuse for not doing all those household chores that "simply have to be done." Tomorrow!-Henry B. Kane, Secretary, Lincoln Road, Lincoln Center, Mass. 01773

25

The final event of the past year, Alumni Day, found the Class of 1925 sparingly represented. In addition to your Secretary others in attendance were Jim Howard, Sam Spiker, Ed Kussmaul and Ed McLaughlin. . . . Word has been received during the summer of the passing of four members of the Class. Kenneth C. Prescott died in Greenfield, Mass. on May 24, 1967; and Edward H. Hewitson passed away in Rochester, N.Y., on June 20. A funeral notice was received indicating that John G. Dempsey died in Chicago on June 15, 1967, and following services in Chicago, he was buried in Woodstock, Vt. . . . Frank W. Sharman of the Class of 1908 sent a clipping from the Arizona Daily Star of Tucson noting the passing of Weldon Heald on July 29, 1967. Weldon, according to this article, was a prolific free-lance writer, his writings on the West having appeared in the Arizona Highways, The Christian Science Monitor and in some 127 other publications. Two years ago he had published a total of 650 articles. He had lived in Tucson for the last 12 years and had just completed reading proof on his new book, Sky Island, which will be published by VanNostrand in October. Weldon came from Milford, N.H., and studied architecture while at the Institute. During World War II he served in the Army as a climatologist. He was a conservationist and consultant to the Secretary of the Interior on National Parks. He and his wife wrote a number of plays, all of which with one exception were produced.

Just after going to press last spring a letter was received from Kamy Kametani. This was a letter within a letter because Kamy told of hearing from Joe McCarthy who, with his wife and another



Boynton J. Fletcher, '24

couple, was starting a visit to the Far East. Joe noted that when he left M.I.T., he went to work for Western Electric Company; and when the Graybar Electric Company was formed, he worked there until 1963 when he retired. Joe noted that he and his wife with the other couple, also retired from Graybar. have been taking trips each year, spending three months in South America in 1964, three months in Europe in 1965, Scandinavia in 1966, and the Orient in 1967, this last trip taking them to Panama, Yokohama, Manila, Hong Kong, Keelung, Pusan, Kobe, Nagoya, back to Yokohama, then to Tokyo. The first part of the trip was made by freighter, after which they flew to Hawaii, Los Angeles and back home to New Jersey. You may be sure that Kamy treated the group royally while in Tokyo. He and his wife met the McCarthys and their friends, the McGraths, at the Imperial Hotel where they enjoyed a sukiyaki dinner. Kamy pointed out that if you do not know what sukiyaki is, you have to come to Tokyo to find out, as Joe did! Quoting from Kamy's letter: "Sukiyaki restaurants tell us that sukiyaki beef is provided at their own pasture feeding them with beer and even rubbed down so that their beef will be tender at eating. There may be many sukiyaki restaurants in U.S.A run by Japanese, but you will find hardly as good beef as in Japan unless the beef was imported from Japan directly." Enclosed with Kamy's letter was his annual contribution to the M.I.T. Alumni Fund. He sets a good example for all M.I.T. Alumni in that he never fails to make his annual contribution.

A number of news items have come in via the Alumni Fund returns. Alan W. Crowell notes that he has now been located in Fort Worth for a little over two years, working as Sales Manager for the EMC Company. This was a small company in 1965 but is growing rapidly, tripling its volume in 1966 and expecting to be up five times 1965 in the present year. The company builds vacuum forming machines for forming sheet plastic, and are also custom vacuum formers with a few proprietary products. Alan likes the Fort Worth climate very much. . . . From Henderson L. Holman, Jr., in

Ozark, Ala., comes word that he recently returned from visiting his 22nd foreign country. As a vacation he took his oldest grandson on an Arctic Expedition a year ago. He notes that during 1964 he served as Alabama's Kiwanis District Governor, and won the world-wide award, Gold Medal, etc. for achievement during his term of office. . . . Omar C. Hopkins, S. M., notes that he retired for the second time in 1966 and has established his headquarters on the West Bank of Chesapeake Bay at Scotland, Md. . Mabel M. Rockwell notes that she is involved in research on pattern recognition and adaptive learning devices in the Electrical Engineering Department at Stanford University. She also finds time to indulge in her hobby of classical archeology, combined with travel in Greece and Turkey. She has published several travel articles and has written one book entitled California's Sea Frontier.... One interesting address change indicates that John E. Black is now located at Viale dell 'Arte 5, Rome, Italy. This is a long way from John's previous locations in Virginia and New Jersey .-F. L. Foster, Secretary, Room E19-702, M.I.T., Cambridge, Mass. 02139

26

It began to seem late in the month for the class notes reminder card so we called up the Review office and found that notes were due a week ago, and it said so in the new instructions we hadn't read. We have now found the letter and read as far as where it says make the Oct/Nov issue short. We are expecting to succeed either by getting nothing published or by what will come off the end of this pen by bedtime. During the summer we had but one '26 visitor, our venerable transportation chairman Bob Dawes. We needed some shock cord for our boat cover and dropped a note to Bob. Next evening Ruth said. "There's a man coming down the driveway with a package. "What service, Bob, the President of the company, with enough shock cord to take care of all the boats in the fleet. (For non-yachtsmen and non-parachute jumpers, shock cord is multiple rubber threads encased in a braided fabric cover, very useful to take up slack anywhere on a boat.) Bob and Evelyn came aboard for a cocktail on the terrace and I dissappointed him terribly by failing to notice that he had shaved off his beard. We'll take Bob with or without a beard. The most faithful correspondents this summer have been Jim Killian and Dave Shepard. Jim's first letter said, "Dear George: On August 5 Liz and I drove up to Franconia, N. H., to attend the 40th wedding anniversary of the Dwight Taylors at their summer place there. The Taylor children had planned a large party of relatives and friends, and it was a very happy occasion. This may be of interest for your 1926 chronicles. Yours cordially, Jim." His second letter contained a clipping Liz had cut from the New York Times September 1 from which we quote, "Mr. and Mrs. Eben Brown Haskell have announced the engagement of Mr. Haskell's daughter,

Miss Judith Brown Haskell, to John Hutchison Kress, son of Mrs. Rush Harrison Kress of New York. The wedding is planned for late September. Miss Haskell is a graduate of the Prospect Hill School in New Haven and Vassar College and recently completed a course at the R.C.A. Institutes in New York. Her father is director of area development with the United Illuminating Company of New Haven and Bridgeport."

Dave Shepard's first note was to lend sympathy to your Secretary who as the result of a sneeze landed in the hospital with his back out of joint and missed Alumni Day for the first time. Incidentally, Dave has a new activity that was recently reported in the Wall Street Journal, "David A. Shepard was elected Chairman of Rand Croporation at a meeting of the corporation's trustees. He succeeds Frank Stanton, President of Columbia Broadcasting System Inc., who retired after serving the limit of 10 years for trustees. Rand, a nonprofit corporation with headquarters in Santa Monica, is engaged primarily in research on national security problems. Mr. Shepard is a Director of Merck & Company, and Dominick Fund Inc., and a trustee of the Massachusetts Institute of Technology, the American University of Beirut, the Carnegie Corporation of New York and the New York Public Library." Another communique from Dave brought the following sad news, "Dear G. W.: Last Saturday's New York Times included the enclosed article about Charley Bianchi's death. I was very sorry to see it. As it happens, I had not seen Charley for many years in spite of working in the same community most of the time. Best regards. Sincerely, Dave." The clipping said, "Charles A. Bianchi, since 1964 President of Carter, Walker & Co., Inc., 45 Wall Street, Manhattan, members of the New York and American Stock Exchanges, died yesterday in Mountainside Hospital here after a brief illness. He was 64 years old and lived here at 10 Crestmont Road." . . . We have surely used up the space allotted; it is also time to set the alarm for tomorrow morning. Since this is the Oct/Nov issue, it is appropriate to say happy Thanksgiving and cherrio until next month.-George W. Smith, Pigeon Cove, Mass.

27

Joe Burley and his supporters finally won the 40-year campaign to invite wives to a Class of 1927 Reunion. And even the die-hard naysayers are admitting now that it was a good idea. The girls all pitched in to add to the fun, and they certainly raised the tone of the gathering from an aesthetic point of view. For a grandfatherly crew, we didn't do too badly in rousing ourselves to make the trip back to the Reunion. There were 70 of us who showed up at Bald Peak, or at Alumni Day at the Institute, or both. The "active" list is currently 580; but the "active" list includes all those for whom the Alumni Office has current addresses, and many of them are scattered to the

four courners of the continent, and overseas. To get the statistics out of the way attendance at Bald Peak was 98, 59 members of the class and 39 wives. At the Alumni Day dinner on June 12 there were 30 of us, plus 17 wives; this included eight classmates who had not been able to get to Bald Peak.

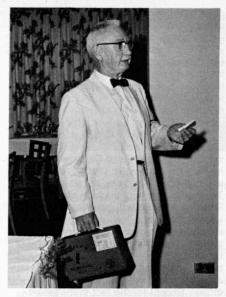
For most of us the most heart-warming memory of the Reunion is that Jim Lyles maintained his unbroken record of attending every five-year reunion since graduation. As all the readers of the Review Class Notes know, Jim has been seriously ill for the past several years. Though he has made substantial progress on the road to recovery, he is still on the road. But in spite of his physical handicap he has kept his sense of humor, and his wit is as keen as ever. His courage, and Molly's, were an inspiration to all of us. There are, by the way, only two others with a perfect attendance record at all reunions, Dike Arnold and Bob Bonnar. This was the first reunion Glenn Jackson had missed. Glenn is overseas but he sent a long letter of greeting to the Reunion, and he did his share in letters from Iran, which all the class received, in building up the 40th Reunion Gift. Bud Fisher did a magnificent job of spearheading the Reunion Gift drive, and we all felt a sense of pride when he announced it at the Alumni Day luncheon, \$422,589. There were six present who had never attended a previous reunion, Linc Dyer, Bill Felch, Avedis Kazazian, Mid Perry, Phil Rhoads, and Hank Steinbrenner. Kazazian had made the longest trip to the reunion, from Antofogasta, Chile.

First arrivals registered at Bald Peak on Thursday, June 8, a day ahead of time, including Reunion Chairman Bonnar and Fran Bonnar, Chairman of the Women's Committee, who were there to see that everything ran smoothly. By Friday night all but a few had registered, and some had already managed to get out on the golf course. The only thing on the schedule for Friday was good fellowship, and there was plenty of thatrecognition of old friends, introductions of wives, conversation about children and grandchildren, absent friends, careers and retirement. The scrapbook of answers to 40th-Reunion questionnaires passed around at Bald Peak was not complete, but is showed that several dozen of the class have already retired. Saturday the more athletically inclined were playing golf or tennis, there were 21 out on the golf course, but only a few on the tennis courts. And those who preferred milder exercise were on the putting green or the croquet court. It was an English croquet court, and Dike Arnold and Fran Bonnar seemed to be the only two who had learned the complicated rules and could guide the contestants. One group took a boat ride around Lake Winnipesaukee (one of the prettiest lakes in the country); Rosie and Sheri Rosenthal went horseback riding: and the rest contented themselves with a spectator's role.

Late Saturday afternoon Joe Harris treated us to a showing of slides taken

at previous reunions. George Houston's was the largest collection. Perhaps it ought not to go on the record that when the projector broke down in the middle of the showing, M. I. T.'s engineers stood by while one of the club waiters got it going again. Cocktails on the terrace were followed by the taking of two Reunion pictures, one with the wives and one without (some of the die-hards wouldn't give up easily), and then the Reunion banquet. Athletic prizes awarded at the banquet were as follows: Golf: low gross, Pete Peterson, 1st; George Saliba, 2nd; low net, Howard Ferguson, 1st, Don Wylie, 2nd, Dike Arnold, 3rd; blind bogey, Ray Hibbert, 1st, Larry Drew, 2nd, Bill Taggart, 3rd; most 9's, Ray Hibbert; high gross, Charlie Pope. Tennis: The prize went to our perpetual winner, Larry Day. Croquet: Couples, Mary and Dick Hawkins, 1st, Zella and Ray Hibbert, 2nd; women, 1st, Cecil Stevens and Marion Knowles, 2nd, Ruth Whittier and Anne Boyle. Putting (for women): 1st, Molly Lyles, 2nd, Ethel Wise and Grace Collins (tie), 4th, Ann Harris. A special prize was awarded to Bob Bonnar for his surperb job in organizing the reunion. . . . Before the election of officers Bob Bonnar paid a brief tribute to Jim Lyles who has held the class together so effectively all these years, and presented him on behalf of the Class with a rare framed oil painting from Iran, painted on camel bone, together with a framed certificate describing its origin. Bill Taggart, Chairman of the Nominating Committee, presented the proposed slate of officers for five-year terms as follows: Honorary President, Jim Lyles: President, Dike Arnold; 1st Vice President, Ray Hibbert; 2nd Vice President, Glenn Jackson. Other officers are Joe Harris, Secretary; Bob Bonnar, Treasurer and Reunion Chairman, Dick Hawkins, Class Agent; Bud Fisher, Reunion Gift Chairman; Joe Melhado, Class Historian. The slate proposed by the nominating committee was approved unanimously. . . . This final order of business at the banquet was to indicate our enthusiasm for the arrangements for the 40th Reunion by requesting the Reunion Committee to try to set up the 45th at Bald Peak again.

Sunday the ranks thinned out rapidly as most left for Alumni Day at the Institute. Those present at Bald Peak were, with wives: Dike Arnold, Charlie Bartlett, Al Billings, Bob Bigelow, Bob Bonnar, Jack Boyle, Stuart Bugbee, Joe Burley, Gordon Calderwood, John Oliver Collins, Morgan Collins, Larry Day, Howard Ferguson, Bud Fisher, Larry Grew, Joe Harris, Dick Hawkins, Ray Hibbert, George Houston, Tom Knowles, Jim Lyles, Joe Melhado, Frank Meyer, Bill Payne, Middleton Perry, Carl Peterson, Phil Rhoads, Anson Rosenthal, George Saliba, Don Spitzli, Hank Steinbrenner, Ezra Stevens, Ralph Stober, Bill Taggart, Ed True, Russ Westerhoff, Carl Whittier, Bob Wise, and Don Wylie. Also present at Bald Peak: Nat Cohn, Johnny Drisko, Ed Dunn, Linc Dyer, Bill Felch, Dick Harrison, Harry Inskeep, Godon Jacoby, Bill Kaplan, Al Kauzmann, Avedis Kazazian, Ted Leach, Lloyd MacAdam, Harry Moser, Roger Peirce, Pete Peterson,





Charlie Pope, Charlie Smith, Fred Willcutt, and Les Woolfendon....The following were present at the Alumni Day dinner: Dike and Claire Arnold, Charlie and Ann Bartlett, Jack and Anne Boyle, Joe and Ruth Burley, Ed Chase, Harold and Esther Edgerton, Bill Felch, Howard and Celia Ferguson, Larry and Lillian Grew, Dick and Mary Hawkins, Bill Kaplan, Avedis Kazazian, Ed McCabe, Joe and Marion Melhado, Frank Meyer and Mrs. Meyer, John W. Moore, Harry Moser, Charlie Pope, Mid and Edna Perry, Bill and Helen Richards, Sara Scudder (the only co-ed of our class to show up), Charlie Smith, Ezra and Cecil Stevens, Bill and Jill Taggart, Ed and Ann True, Dick Turner, John P. Vinti, Russ Westerhoff and Mrs. Westerhoff, Fred Willcutt, Bob and Ethel Wise. At the Alumni Day luncheon, in addition to practically all of those at the dinner, were Bud Fisher, Jim Henry, Ed Mott, Gordon Jacoby, Russ McCassey, Adelbert Billings, Bob Bonnar, Stuart Bugbee, George Houston, Nat Cohn, Francis Guscio and Lauritz Rasmussen. Many of them came with their wives .- Joseph H. Melhado, Class Historian, B Standard Brands, Inc., 625 Madison Ave., New York, N. Y. 10022





At the '27 40th Reunion banquet Charles S. Pope speaks after receiving a golf award; Ezra Stevens presents a golf award to Howard P. Ferguson; Dwight C. Arnold, newly elected President, Raymond F. Hibbert, newly elected Vice President, and J. Robert Bonnar, Chairman of the Reunion Committee, chat at the speaker's table; Mr. Stevens presents golf award to Louis B. Peterson.

Members of our Class who registered for Alumni Day last June included Chris Case and wife, Jim Donovan and Frances, Florence Jope, Herm Swartz and Dorothy, Abe Woolf and Ruth, Charlie Worthen and Velma, and Jim Morse. There should have been more. At the memorial service held at the chapel on Alumni Day we note that those remembered from our class who passed away during the past twelve months included Thomas S. Bacon. Geoffrey D. Baker, William H. Carlisle, Jr., Carmer Criswell, Robert G. Freeman, Donald S. Kennedy, Henry H. Miller, Charles W. Rogers, John A. Russell, Gilbert Smiley, H. Bowen Smith, W. Morgan Swingle, J. Stuart White, and Wayne E. Wilson. . . . During this past summer many meetings were attended by members of the Reunion Committee, which resulted amongst other things in the formation of a chart which shows a Steering Committee and chairmen of various functions. With Abe Woolf as General Chairman, the Steering Committee consists of Jim Donovan, Roland Earle, Bob Harris, Florence Jope, Art Nichols, Walt Smith, Herm Swartz, Abe Woolf and Charlie Worthen. Jim Donovan will have charge of the Class Gift, finances and registration. Charlie Worthen is manager of publicity, the Class book and Class pictures, Art Nichols will supervise mementoes. Ruth Woolf and Velma Worthen will head the Hospitality Committee. Walt Smith is general manager of all Reunion activities including entertainment and meals. There are about 40 additional names of men and women who are on these committees, and we hope to publish these lists later.

From a variety of inter-office correspondence from Jim Donovan to himself, which is undoubtedly a reflection of his state of mind while in the midst of his solicitation for the 40th Class Gift, we have gleaned the following notes: "I have seen and talked with, and in some cases had dinner or luncheon with, Bill Archibald and his wife, Homer Burnell, Jan and Jack Chamberlain, Roland and Helen Earle, Don and Trudy Francis, Carney and Dorothy Goldberg, Al and Jo Gracia, Bill and Ella Garfinkle, Wally Heidtmann, Dick Hildick, Stan Humphrey, Bill Hurst, Bob Kales, Morey Klegerman, Ed Poitras, Abe and Ruth Woolf, also Bill and Marjorie Bendz, Harold Bialkoswky, Ray and Edith Wofford, Herm and Dorothy Swartz, Dick and Ethel Rubin, Bill and Sally Hall, and, of course, the wonderful Worthens. There are several others whom I have talked to personally on the telephone or had what may be definitely called personal letters: George and Ruth Bernat, Morey and Rose Beren, Mrs. Leslie B. Cutler, John Leslie, Tommy Larson, Bob Larson, E. Vernon Lewis, Bill McClintic, Henry Moggio, George and Ann Palo, Ed Petzold, Ed Stevens, Art Josephs, Johnny Stack, Bob Joyce, Tom Harvey, and many, many others. . . . At a wedding I saw Chubby and Carl Harris. I asked Carl what I should say about him in class notes and it turns out that, as with most

of us, Chubby and he talked about the children. Now they've got so many I can't remember all the story! One daughter is married and lives near them; a son is doing technical editing in New York; another daughter, I believe, is out on the West Coast; and if I remember correctly, another was out of the country doing something very interesting. Well, you can see I didn't do as a reporter should do, write down these important items! Chubby herself is doing library work in Weymouth, and Carl claims he's taking off weight. Trudy Francis writes that Don and she are doing well. They're doing some thinking about our Reunion and, indeed, have found an item which they are submitting for consideration as a memento. During the summer I saw Art Nichols one day at lunch and had the pleasure of saying hello and talking a bit. Also, Jan and Jack Chamberlain invited us down for dinner. Except for the fact that I talked too much and stayed too long, it was a very heartwarming and wonderful afternoon. Jack is taking it a little light on work. He was revising the third edition of a chapter he has written in one text on the medical field, working on some articles and still carries on at M. I. T. . Florence Jope was able to visit a daughter and son-in-law in England. Her postcards were ecstatic. She went down to Cornwall where Ralph's ancestors had originated."... Which reminds me that your Secretary received a note from Florence dated July 14, in which she says: "Just a quickie during my 11th hour preparation to spend three weeks visiting and touring in England with Debby and her family while they are in London on a six-months exchange program among the various international branches of Price Waterhouse & Company. Today came the wedding announcement from John Melcher, announcing the marriage of daughter Pamela Hill to Arthur Hideyuki Okazaki in Philadelphia on Saturday the first of July."

From the M. I. T. Alumni Register Office we have received the sad news of the recent deaths of six of our classmates as follows: Geoffrey Dawes Baker, Course 15, of Charlotte Hall, Md., died December 1966; Edward Birkenwald, Course I, of Augusta, Maine, on June 14, 1967; Fred B. Brown, Course I, of Kenmore, N. Y., on March 16, 1967; Arthur Campopiano, Course 4A, of Providence, R. I., on July 29, 1967; Charles E. Richheimer, Course 15, of Tavernier, Fla., on June 16, 1967; J. Stuart White, Course 6, of Taunton, Mass., on April 29, 1967. ... From Reynolds, Smith & Hills, Jacksonville, Fla., of which Charlie Richheimer had been a partner for a long time and was listed as a consultant during the past few years, a letter states, "It is with deep regret that we inform you of the untimely death of Charles E. Richheimer on June 16, 1967. Mr. Richheimer was a founding member of the firm of Reynolds, Smith & Hills and directed the sanitary engineering activities of the firm until his retirement in 1958." From a biographical sketch submitted with the letter we learned that Charlie was born in Chicago, December 30, 1907. He was

married in Jacksonville, Fla., on April 29, 1937, to Helen Biddle Youngberg who died August 18, 1965. Charlie practiced as an engineer in Jacksonville and New York City from 1928 to 1935. He was a partner in G. A. Youngberg and Associates from 1935 to 1941, and was a partner in Reynolds, Smith & Hills from 1941 to 1958. He was a consultant from 1958 to the time of his death. He was a commissioned officer in the U. S. Army Sanitary Corps from March 1943 to November 1945. He had extended experience in design and supervision of water distribution and water systems and water softening plants for municipalities and industries, and in the design and supervision of facilities for the collection and treatment of sanitary and industrial wastes. He was instrumental in developing automatic sea water regenerated zeolite water softening plants for municipalities and industries. He was the author of numerous articles on water treatment plants for technical journals. He is survived by one daughter, Mrs. Thomas W. Harwell of Long Beach, Miss. From Betsie Harwell Jim Donovan received a letter which stated: "I feel sure that by now you have heard of Dad's tragic death in an automobile accident on June 16. Last week when I went down to the Keys, I found your letter about plans for next year's Reunion. Dad was really looking forward to that and was planning to take time out from his fishing to join everyone there. I'm sure he would have happily and proudly supplied all the smoked fish anyone could want. M. I. T. and the Class of '28 were of very great interest to him. I'm glad you both had such a nice visit recently.'

From the Dallas Times Herald of Sunday, December 18, 1966, we quote the obituary of Tom Bacon: "Last rites will be at 2 p.m. Sunday in the Church of the Incarnation for Thomas S. Bacon, Vice President of Research and Development for the Lone Star Gas Company since 1958. He died Friday in a Dallas hospital at the age of 61. Mr. Bacon, who joined the Lone Star Gas Company in 1931 as a research engineer, served the company as chief engineer of the transmission division from 1947 until 1955 when he was appointed director of research and development. The engineer was also a director of Lone Star Gas and its subsidiaries, Lone Star Producing Company and Lone Star Gathering Company. He also was a director of Nipak, Inc., a subsidiary of the Lone Star Producing Company. A native of Philadelphia, Pa., Mr. Bacon was graduated from Swarthmore College in 1926, and he received a master's degree in chemical engineering in 1928 from the Massachusetts Institute of Technology. The 30-year Dallas resident was active in American Gas Association and Southern Gas Association programs, and he was a member of the American Chemical Society, the Dallas Engineers Club, the American Institute of Mechanical Engineers and the American Society of Mechanical Engineers. He also belonged to the American Petroleum Institute, Sigma Xi and Sigma Tau fraternities, and the

Society of Friends. Survivors include his wife, Mrs. Frances Small Bacon; a daughter, Miss Carolyn Bacon of Dallas; three sons, John Bacon and David Bacon, both of Dallas, and Thomas Bacon of Houston; two brothers Edmond Bacon of Philadelphia, Pa., and Robert Bacon of Old Chatham, N. Y.; and one grand-daughter."—Hermon S. Swartz, Secretary, Construction Publishing Company, Inc., 27 Muzzey St., Lexington, Mass. 02173

29

Alumni Day in June seems a bit remote. but you will be interested to know it was attended by the following from our class: Edward Farmer, Mr. and Mrs. Walter Gale, Virgil McDaniel, Frank Mead, Mr. and Mrs. Newell Mitchell, Violet O. Parker, Alfonso Tammaro, and Olive and John Rich. . . . Gordon Williams, who was erroneously reported in our June issue as Director of the Center for Research Libraries (a coincidence of another Gordon Williams who made the headlines), spent this Alumni Day in northwestern Australia. He writes, "Without seeming to overshadow Wally Gale as a world traveler, I might mention that this is the 18th country in 18 years in which I have made engineering studies. This job is a railroad location for one of Australia's large iron ore developments in the interior deserts." From another card sent from his home in Scarsdale, N.Y., Gordon writes, "Soon after this reaches you I will be on my way to Brazil, my second trip there this year. This time it is hydroelectric power." Gordon sends his best regards to all the '29 gang. Thanks, Gordon, for setting us straight on your activities-it was nice to hear from you.

From news releases we learn that Myra and Frank Stratton of Wilbraham (Massachusetts) Academy provided "piano music for four hands" at the Springfield Smith College Club this past May. Frank holds a master of music degree from the Eastman School of Music. . . . Bion H. Francis, Jr., of White Plains Road, Trumbull, Conn., is now Manager of Planning and Operations Research in the Inventory and Production Control Department of Warner Slimwear-Lingerie. Bion writes columns on sports car activities and is the president of the Connecticut Council of Sports Car Clubs. . . . McDonnell Company's former President, Walter F. Burke, is now President, Chairman of the Board, and Chief Executive Officer of Conductron Corporation in Ann Arbor. Mich. Walter has served in various positions, ranging from creative engineer to executive, in the aerospace industry for the past 28 years. . . . The Tenth Congress on Hydraulics and Hydraulic Engineering was held in February of this year at the University of Cagliari, Sardinia; Hunter Rouse, Dean of the University of Iowa's College of Engineering, attended. Back in the November '66 issue we had Hunter at Iowa State. Hope we have it right this time; and we have just received another letter from Hunter (in time for the next issue) which gives





Charles E. Richheimer, '28, Ralph W. Peters, '30

additional information about the travels of this cooperative peripatetic classmate. As a clue to the most recent country he visited, the airmail letter had 5 lei and 35 bani worth of stamps. . . . We understand that **H. D. Wilde** of Houston, Texas, is planning to attend the Inter-American Conference on Materials Technology in San Antonio next May, along with some 1,500 other educators, scientists and engineers from Canada, Latin America, and the United States.

We periodically receive from the Tech Review office notices of the deaths of classmates. Belatedly we express sorrow to learn of the passing of Major Charles A. Campbell of Wauseon, Ohio, in 1957; Sister Mary Isabelle of the Emmanuel College in Boston on December 16, 1960; and Frank M. Bondor of Kansas City, Mo., in November of 1963. Also, Alvin Lodge of Erie, Pa., who died March 4, 1967, and Dr. Alfred Guenther of Warwick, Rhode Island, who died March 31, 1967. . . . Olive and I just got back from the fifth M.I.T. Alumni Seminar on "Cities in Crisis" and will have further news of this weekend next month. With another year of class reporting ahead of us, we again solicit your cooperation in sending in news for this column. Many thanks.--John P. Rich, P. O. Box 503, Nashua, N.H. 03060

30

As usual a rather respectable pile of source material accumulated over the summer. However, upon inspecting the pile more closely I found that its size was somewhat deceptive. A certain number of the nuggets set forth below were embedded in extensive matrices of press releases. . . . Let us start with an item that did not come from a press release. You will recall that for a number of years Yicka Herbert proudly held the record for the classmate having the youngest child. However, Yicka's youngest has now reached the ripe age of 10, and it appears that this record has passed to another classmate. The comment on Yicka's youthful brood in the June notes stimulated Morris Shaffer to write from New Orleans that he too is "experiencing the manifold pleasures of playing parent to 'small fry' " and that his household includes a 5-year old "blonde bombshell." Do we have any challengers? . . Ralph Peters has been elected a director of TAPPI in which he has been active for many years, most recently as chairman of the TAPPI Paper and Board Manufacturing Division and Chairman of the

Fourdrinier Committee. As most of you know, Ralph is Assistant Superintendent of Kodak's Paper Mills Division in Rochester. . . . Ed Mears has been appointed Senior Vice President of the Dewey and Almy Chemical Division of W. R. Grace & Company in Cambridge . .Sidney Kaye has been appointed trustee of the Boston Rotary Student Aid Fund....Paul Richardson reports that his retirement "is coming up fast. If any of my illustrious classmates have any ideas, please forward them to me at 15151 Minock Ave., Detroit, Mich. My heart is in New England, but my flesh gets weak in winter." . . . Raymond Binder has been elected a Fellow of A.S.M.E. He is Professor of M.E. at U.S.C. at L. A. . . . Three of the four America's Cup contenders this year, including the newest entry Intrepid, were designed by Olin Stephens.

Some years ago Dave Landen developed a system of topographical mapping that has since been used by eight countries in the mapping of the Antarctic continent. In recognition of this contribution he has had a mountain named after him. Mt. David Landen is on the Cole Peninsula on the east coast of the Palmer Peninsula in Antarctica. Dave is chief of the Special Projects Unit, Topographic Division, U.S. Geological Survey in Washington. His Division is concerned with improving topographical mapping by photogrammetric and electronic means. He is also (1) Assistant Professor and part-time lecturer on geodetic and cartographic science at G. W. University, (2) President of the Potomac Region of the American Society of Photogrammetry and (3) a director of the Washington, D. C., Society of Engineers. Dave and his wife Jeanne live in North Arlington, Va., and have two children, Jim and Deborah. . . . Jim Morton is starting his third term as Chairman of the Board of Public Works in Wellesley, Mass. . . . Worthen Taylor has been appointed co-ordinator of water quality standards development of the Northeast regional office of the Federal Water Pollution Control Commission.

Since the last notes were written notices have come in concerning the deaths of three more of our classmates. Paul Hahn died in Bethesda, Md., on May 3. After graduating with our class Paul obtained a Ph.D. in biochemistry at the University of Rochester and worked with Dean Whipple in the study of iron deficiency anemia, work which led to improvement in iron therapy and to new knowledge of how hemoglobin and red cells are formed. His greatest contributions were made in the field of cancer therapy and diagnosis at Vanderbilt University Medical School where he introduced colloidal radioactive gold, an agent now used for cancer therapy throughout the world. At the time of his death Paul was assistant to the director of the National Center for Radiological Health of the U.S. Public Health Service. He is survived by his wife Ruth, four sons and two daughters. . . Zareh Sourian died in New York on April 17. He was a trustee of the Institute

of Architectural Education and a member

of the N. Y. Fine Arts Federation, the

Architectural League of N. Y. and the N. Y. Society of Architects. Among the buildings he designed are the Seafare and La Potinier restaurants, the Armenian Cathedral Diocesan House and 116 Central Park South. He also painted landscapes, still lifes and portraits and held shows of his work here and in Paris... Joseph Wight died in Montreal on May 27. He made his home in Winterport, Maine, and worked as a professional mechanical engineer in many states and the Maritime Provinces. He is survived by his wife Nancy, a son and two daughters. The notice of his death came to me in the form of a news clip kindly forwarded to me by a "friend and classmate, as well as Brother Shriner," John Pratt, who lives in Castine, Maine. . . . Changes of address: Melville J. Blackwood, Knox Mountain Road, RFD #1, Franklin, N. H. 03235; Theodore Criley, Jr., 1291 No. Indian Hill Blvd., Claremont, Calif. 91711; Thomas M. Emery, Apt. 143 A, 3162 Glouchester Road, Troy, Mich. 48084; Jules A. Larrivee, 425 Vineyard Drive, Corvallis, Ore. 97330-Gordon K. Lister, Secretary, 530 Fifth Avenue, New York, N. Y. 10036

31

Quite a reunion resulted from invitations to Class Officers and sometime Reunion Committee members within any sort of hailing distance to come and bring their spouses for a cookout and get-together at the home of Jean and Claude Machen in Wellesley on May 26. The idea grew at the installation banquet for President Howard Johnson in April. The Damianos, Germeshausens, Hubbards and Machens constituted themselves an ad hoc committee to provide food, mixers and a place to meet and the usual Class of '31 spirit took care of the rest. The calendar said "spring," but the evening was cold and rainy so we couldn't enjoy the garden party. The house, however, took care of the 40 who came, can we could even enjoy Jean's flood-lighted garden without getting wet. Prize for distance went to either the Richardsons from New Britain or the Wordens from Westport, but the Boyntons came down from New Hampshire and the Pierces from Cape Cod so our representation was good. We were especially pleased to see Thelma and Chuck Turner-our 25th Reunion Chairman. The Olsens brought pictures from our 35th as did the Germeshausens. Others at the party were the Gordons, the Holsts, the Johnsons, the Martins, the Barnards, the Kohlers, the Swantons, the Sinclairs, the Davises, and the Goodmans. The spontaneity of the gathering perhaps contributed to its success, but all agreed that a repeat with a broader invitation list ought to be on the docket before the 40th Reunion comes up.

Since the last Class notes, I have had lunch with **Dave Buchanan**, **Wally Tibbets** and **Jack Lane**. Wally was heading for the Philippines on a job and will return sometime before Christmas. There is a possibility that he may be sent back, and I'm sure it wouldn't hurt his feelings. Jack's wife, Bert, had just undergone a

major operation and seemed to be recovering rapidly. . . . Arnold Childs retired over a year ago from Sun Oil Company where he had been Manager of Marketing Research. He has sold his home in Rosemont, Pa., and returned to New England. Last October he found an old Cape Codhouse built in 1784 with a wonderful view of Franconia Notch. His address is R.F.D. No 1, Campton, N. H. 03223. . . . Congratulations to F.M. Baker upon his election as Executive Vice President of Kentucky Power Company.

Yours truly is writing this in London. Louise and Babbie are both with me, and all of us are enjoying Babbie's first trip to the U.K. and Europe. After spending about a week here we are going to Paris, then on to Holland, Geneva, Rome, and Madrid. . . . It is with much sadness that I must tell of the death of Joseph W. Wetmore who passed away on April 11, 1967. He was a leading research scientist at Langley Research Center and wellknown for his work on flight safety aircraft performance. . . . In addition to Arnold Child's new address, the following have been received: Major General Robert J. Fleming, Jr., Panama Canal Company, 435-13 St. N.W., Washington, D.C. 20004; Colonel Wiley T. Moore, Apartment 1201, 10401 Grosvenor Place, Rockville, Md. 20852; George Moy, 2400 Hudson Terrace, Fort Lee, N. J. 07024; Norman C. Thomas, 8 Union Street, Marblehead, Mass. 01945.-Edwin S. Worden, Secretary, 35 Minute Man hill, Westport, Conn.

32

At the Class meeting during the 35th Reunion in June the following Class officers were elected for the term 1967-1972: President: Harry L. Moore, c/o Mobil Oil Corporation, 633 Third Avenue, New York City, N. Y.; Vice President-Boston: Robert E. Minot, 8 Newbury Street, Boston, Mass.; Vice President-New England: Isaac H. Schwartz, 1212 Kempton Street, New Bedford, Mass.; Vice President-New York City: Clarence M. Chase, Jr., 1710 Watchung Avenue, Plainfield, N. J.: Vice President-Washington-Philadelphia: James Harper, 2700 So. Grant Street, Arlington, Va.; Vice President-Southeast: Theodore Jones, 975 Cambellton Drive, No. Augusta, S. C.; Vice President-Midwest-Akron: Louis Vassalotti, 127 Kenilworth Drive, Akron, Ohio; Vice President-Midwest-Chicago: Thomas W. Regan, 2106 Greenwood Avenue, Kenilworth Gardens, Wilmette, III.; Vice President-Midwest-St. Louis: Otway W. Rash 3d, Carling Brewing Company, 2101 West E Street, Belleville, III.: Vice President-Midwest-Michigan: William A. Kirkpatrick, Kalamazoo Paper Box Company, 391 So. Pitcher Street, Kalamazoo, Mich.; Vice President-Southwest: John Lawrence, 5527 Meaders Lane, Dallas, Texas; Vice President-North Pacific Coast: Charles C. Wyatt, Wyatt and Kipper Engrs., Inc., 3214 16th Avenue SW, Seattle, Wash.; Vice President-South Pacific Coast: Rolf Eliassen, Stanford University, Department of Civil Engineering, Stanford, Calif.; Vice

President-Western Europe: Juan Serrallach, Napoles 113, Barcelona 13, Spain; Vice President-Latin America: Julio J. Gallese, Plaza San Martin 982, Lima, Peru; Secretary: Elwood W. Schafer, M.I.T., Rm. 13-2145, Cambridge, Mass.; Treasurer: Don Whiston, P. O. Box 10, Wapping Road, Kingston, Mass.; Class Agent: Thomas E. Sears, Jr., c/o Thomas E. Sears, Inc., 31 St. James Avenue, Boston, Mass.; Chairman-40th Year Gift Committee: Robert B. Semple, c/o Wyandotte Chemicals Corporation, Box 111, Wyandotte, Michigan.

William A Kirkpatrick wrote in June that he was disappointed that he could not get away for the Reunion and sent some news of his activities: "Back in 1960 Governor Williams appointed me to the Board of Control of a yet to be built state college. I am still on the Board and on June 18 we graduated our first four-year class. It was a very exciting occasion for me, and my years of association with the educational council at M.I.T. helped materially in enabling me to make substantial contributions to the establishment and growth of this new college which is located about 15 miles west of Grand Rapids on the Grand River. We have a mile and a half stretch of straight river running north and south which is well protected from prevailing winds, and this year we were able to boat our first crews. They did quite well, and crew will be a major sport at the college which so far is strictly liberal arts, emphasizing preparation for teaching, business, law and medicine. A couple of weeks ago my daughter, Celia Wilson, presented us with twin grandsons which with the one they already have gets me pretty well started on the roll of being grandfather. I find this exciting although I know that many of my classmates have held this distinction for many years." . . . A letter from Mrs. Gladys Samuelson tells us that her husband, Paul B. Samuelson, passed away on April 22, 1967. Paul had come to Huntsville, Ala., five years ago as engineer in the Hercules Project Office of the Redstone Arsenal. He also leaves a daughter, Mrs. Hugh A. Carter, Jr., of Philadelphia. . . . Robert W. West writes from 101 Northwood Avenue, Silver Spring, Md., that he has retired at 64 and thoroughly enjoys his main job of nursing a brand new lawn.

Roger J. Zampell writes that he is still enjoying his job as Head of Engineering Design of Research Facilities with the Naval Research Laboratory in Washington, D. C., and that his son, Roger, Jr., has entered the School of Architecture at Georgia Tech. . . . Paul A. Robert writes from Cincinnati, Ohio, that he has become Vice President and Director of Operations of Access Corporation, having left Univac Division of Sperry Rand Corporation in September 1966. John Navas writes that "Fittings that Fit Inc." will finish their new manufacturing facility and office building with balconies all around and all glass facade facing the San Gabriel Mountains as his principal accomplishment for the year. . . . Lester Glickman reports that of the eight men comprising the U.S. Naval Underwater

Weapons Research and Engineering Station at Newport, R.I., four are M.I.T. graduates: Lester Glickman, '32, Richard Dunlap, '40, Caesar Spero, '44, and John Brady, '48. . . . Mrs. O. Mason Burrows (whom we knew as Anita Catherine Sarabia) writes that her husband Sam, '31, is in research and development with the Norton Company, Worcester, Mass.; son Bob is in computer programming at Massachusetts General Hospital, Boston; son Tom is in industrial design at Syracuse University; and she is applying the knowledge acquired in Course VII (Biology and Public Health) to today's social problems as Director of Public Welfare in the Towns of Southboro and Stow, Mass.

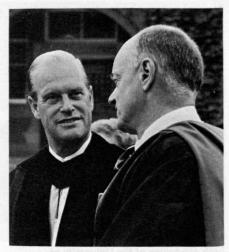
Jacob Millman has been honored by the "Great Teacher Award" presented an-nually by the Society of Older Graduates of Columbia University. He has been on the Columbia faculty since 1952 and is now Chairman of the Department of Electrical Engineering. After receiving his Ph.D. degree in physics at M.I.T. he served as one of the leading scientists on the staff of the Radiation Laboratory during World War II. This award citation honors him for his three decades of teaching, his four comprehensive textbooks and his service to government and business. . . . Howard F. Carver has been elected President and Chief Executive Officer of the Gleason Works, Rochester, N. Y. Howard joined the Gleason Works organization in March 1934, became Sales Manager in 1945 and Executive Vice President in 1956. He and his wife live at 80 Whitewood Lane; his son John is a graduate student at Purdue University; and his daughter is Mrs. Linda Halldow. . . . David W. Bernstein has been elected President of American Biltrite Rubber Company. David joined the the company after graduation in 1932 and has been a director and Vice President of the company since 1954. . . . Frederick W. Green has been elected Vice President, Marketing, of the Nash Engineering Company, South Norwalk, Conn. Frederick joined Nash as Sales Engineer in 1935, was named Divisional Sales Manager in 1951, Director in 1960, and Vice President Sales in 1963. He lives at Cedar Hills in Weston, Conn., with his wife Suzanne and their five children....Joseph T. Cimorelli has been appointed Division Vice President and General Manager of the Memory Products Division of RCA. Joe joined RCA in 1934 as a laboratory engineer and became Manager of the Applications Engineering Laboratory at the Harrison, N. J., plant in 1945 and Manufacturing Manager for Receiving Tubes in 1956. He lives at 10 Cromwell Drive, Morristown, N. J. . . . Edward C. Franklin has been promoted to the rank of full professor in industrial engineering at Georgia Institute of Technology.-Elwood W. Schafer, Secretary, Room 13-2145 M.I.T., Cambridge, Mass.

33

We open another semester, and I have a confession to make. I wrote a rather long letter, mailed in September, long because

of the interference with the annual Alumni Officers Conference and a subsequent trip via the S. S. Lurline, to Hawaii. So with little time to do any writing during that siege I just had to get the stuff out a little early. During the spring I circularized a rather large group of men and women who hold advanced degrees from M.I.T. even though some had not taken their bachelors with us. I had a fine response via the return card route, and I wish to have it understood that this group is probably as loyal and generous as any of us even though some are not originally M.I.T. men. Right on top is Bob Dillon, Course X, from Texas. Bob took his first degree with us and then went on to his masters a year later. In 1941 he married Alice Washburn, and they have one daughter, Patricia, born on Galveston Island. So, Bob has two fine grandsons. He is Production Manager of U.C.C.'s (Union Carbide) Operations team #15, which has their ethylene oxide-glycols and catalysts, whatever those are. We have a short one from Edward P. Hutchinson who did his graduate work at M.I.T. after an A. B. at Bowdoin. Ed is listed in Who's Who in American Men of Science. He has a daughter who graduated from Smith, math major, in June, and his son is a physics major at Harvard. Ed is one of those who took his bachelors elsewhere, but his course has, as yet, no graduate Course Secretary which is why we still have him on our rolls.

L. H. Cirker boils it down well for us: took his S. M. with us, took P. G. work at Brooklyn Poly., and then started a family. He has three sons: Wilkie, 21, graduate of the University of Delaware, and is entering Middlebury and Mainz; Peter 14, in high school; and in between, Christopher, entering in the fall Wilmington (Ohio) College. Hart has done a lot of travelling in the U.S. and in Europe, as travelling is one of his many hobbies. The others are gardening, photography, and music. And here is the punch line; Mrs. Cirker is a former Exeter girl, and they are to drop in and see us one of these days. . . . Just by way of pleasurable variety here's one of our wonderful gals, M.P.H. 1933, Vivian V. Drenckhahn. What a remarkable and distinguished career, a real M. I. T. gal! She has been an Associate Professor in the School of Public Health, University of Hawaii, for 31/2 years; was with the World Health Organization in Europe for 12 years, in health education; spent 9 years in S. E. Asia and in the Caribbean area in the same sort of work. Before that she was with the National T. B. Association in New York City. During the war years she was with the Department of Defense Health and Welfare. Vivian, you are now at leisure, and probably many others who were students when you were are also. You are now, this minute, made Chairman of the 1933 Alumnae Club, committee on recruiting the ladies for the 35th Reunion at Chatham Bars Inn, June 7-9, 1968. I would love to see 10 or 12 of our lovely gal grads show up for a reunion. One told me that no one ever invited the gals. That's all over. You are all now invited. Vivian, please drop me a line of acceptance, won't you?



At Dartmouth this summer, where he received an honorary Doctor of Laws Degree, Robert H. Winters, '33 (above, left, with Dartmouth's President John S. Dickey), called for a "total assault on the problems that block the highways to prosperity of the lesser developed countries."

Increased trade is vitally Important, he said, and the Kennedy Round of tariff reductions promises to remove some barriers to the export of local products. But the real problem among today's less developed nations is the "critical lack" of scientific, technical, and managerial skills.

The international exchange of ideas and of educated men and women between the developed and developing nations is more important than trade or conventional aid. Mr. Winters, who is Canadian Minister of Trade and Commerce, called for a new form of Marshall Plan, "directed not east but south and providing not physical but human capital." And "Until this is done," he declared, "none of us in responsible positions in the more developed countries can be of easy conscience."

From Donald A. MacCornack comes a very welcome card, full of information and typed so that it can be read. Don had a degree from Dartmouth, 1929, but took a bachelors from our School of Architecture in 1933. He just got his 20-year pin from Brookhaven National Laboratory where he is Head of Architectural Planning. B.N.L. took over Camp Upton in 1947, and the Lab still occupies over 100 modified Army structures, as well as many new buildings erected especially for the Lab. I quote, "Have just about phased out community involvement, such as little league, scouting, P. T. A., school board, though Eleanor is still active in many community projects." They have three children: Martha, married and living in Washington, D. C.; Andy is in the Peace Corps; and Rick is a junior at Indiana University.

Paul Netherwood, S. B. 1933 and S. M. 1934 Chemical Engineering, took other courses at Williams and R. P. I. for awhile, but gave up! He married Flo in 1937, and they have three children; Paul Junior who graduated from Williams and is a physicist at Aberdeen Proving Grounds, and is recently married; Judith A. who graduated from Beaver College, married an M.I.T. man, has two children and is living in Williamstown (Mass); Jean A. who has graduated from Lake Forrest College and is teaching French at Lake Forrest High School, and is about to be married to a young chap who has

decided on the ministry and will go after it at Princeton. Paul has completed his 25th year with Sprague Electric Company. He and Flo are both active in golf, skiing, bridge and square dancing; they have travelled extensively in Europe and in the Caribbean, and are coming to the 35th. Paul says that the only classmate he ever sees is **Charlie Cashman**, of Weyerhauser, with whom "I share my paper problems."

Oliver J. Moreland, S. M. Course I 1933, writes from Portland, Ore., where he is Job Chief, Operations Division, U. S. Army Corps of Engineers, Pacific Division. Oliver took his bachelors from the University of Washington in 1932 before coming with us. He and his wife, Edith, have two sons, Jim 25 and Robert 20, both graduates of the University of Oregon. He says that it is doubtful that they will make the 35th though we sure hope that it can be done. This will be a big one and one that we should not miss....From Middletown, Ohio, we hear from S. Alvin Bell who took his S. M. in Chemical Engineering in 1933. Al is an Alumni Fund Chairman, and he has just finished up the latest annual appeal in that area with 79% participation. ... Bill Gray, U. S. Navy, sends me from afar his proposed new address in the States after his return to our country. He has apparently been attached to some mission or other in another country. The Grays will definitely attend the 35th. . . Perley A. Coffin writes from a spot right behind M.I.T., General Latex and Chemical Corporation where he is Laboratory Manager. Perley took his bachelors at Northeastern and his S.M. in Chemical Engineering with us. He lists a few hobbies, stamps and photography, and is married and has a son 16. . . . Lloyd N. Combs writes from Rochester, N. Y., but tells us that his new address is now Wilmington, Del.

We wish to add just a word from Ray Brown who has just moved from his Connecticut address to Basking Ridge, N. J. Ray took both his degrees from M.I.T., the Course VI-A set-up. . . . Here is one from our own Special Vice President, Charles C. Bell, East Wampanoag, R. I. Charlie complains that they are holding the Class Officers' Conference one year too late in San Francisco as, he says, last year the Bells went West to visit with their daughter. He is tied up this year by having to go to Switzerland to visit Basel. It must be business as Basel is a great place to jump off from. He adds that the only item of any possible interest to the faithful is that his son, David, graduated from Harvard this past June and is planning to enter medical school come fall, though he is spending the summer at Massachusetts General Hospital picking up a little experience. . . . We have a very fine note from Dick Fossett, California, in reply to a note of mine mentioning the coming Class Officers' Conference. Dick is a Vice President and was President for many years. He will attend the Conference, and he adds some personal information. He is still with Procter and Gamble in Long Beach, Calif., and is

Staff Manager of the Food Division, which, he says, means jack of all trades. Dick is a member of the Sierra Club, which is a mountaineering organization. And plans are not yet congealed for June 1968 so Dick doesn't know about his attending the 35th. When this column is read in November the Alumni Officers' Conference will be history, and the first chance to report on it will be in the December issue of the Review. This conference is the first ever to be held away from Cambridge, and the Northern California M.I.T. Club will have been deeply interested, and if plans work out, will have been excellent hosts, as they have arranged to conduct all formal sightseeing as well as have charge of certain aspects of the Conference. Of our elected officers, Dick Fossett, Cal Mohr, Elis Littmann and myself are the only ones attending, though there is a far greater number of appointed officers who will be there also.

Now back to the news, Bill Barkley, Course XV, Schenectady and Hampton Beach, N.H., writes a short but interesting epistle. Bill and Ruth celebrate their 31st wedding anniversary soon after he wrote (August 2), and they have twin daughters. Both are at school, one at Syracuse and the other at Ohio State. They must be football fans. Bill informs me that we are neighbors, at least during the summer, and that they live on the shore just north of Hampton Beach, N.H., near the Old Tuck Mill, which Bill is trying to restore as an historic site. Our ever faithful Vice President from N.C. comes through, briefly but timely, with the news that he (Beau Whitton) and Daphne cannot make the Conference of Class Officers but will definitely attend the 35th and perhaps then go on to a trip way Northeast, probably including Nova Scotia. In the pages of some months ago we mentioned that the Whitton's 25-yearold daughter was teaching in Lebanon. Well, Beau and Daphne went there to see her in May and came away just before the recent unpleasantness in Palestine. The little teacher had to be evacuated later and plans to teach in the U.S., which idea seems to be popular with the doting parents. That was a bit of a close call. Beau says that he is looking for three more educational counselors in his area, so that he won't have to work at all. That, Beau, is not why we get these counselors, or is it?

Vernon O. Bowles refused to use the return card and instead sent along a fine letter, too much really to quote entirely. Vern has a B. S. from Stanford and has his masters from M.I.T., 1933, in chemical engineering. It does seem as though I hear from Course X more often than from any other course. After '33 he was with Allied Chemical in Buffalo, then three years with Humble Oil Baytown Refinery. Humble at the time was moving too slowly for Vern, so he joined the Lummus Organization in 1936. During the war years, "I was active with Lummus in connection with the development of process engineering concepts and designs for aviation gasoline facilities built by Lummus." During this time he

drifted into sales work and spent three years deciding on sales or engineering. The latter won as he went with Socony Vacuum Oil Company in 1948 as Assistant Chief Engineer in the Refining Engineering Division. In the next 19 years he has gone straight through and is now Manager of the Process Engineering Division of Mobil Research and Development Corporation's Engineering Department. Vern lives in Katonah, which is 48 miles north of Central Park on the Sawmill River Parkway. Beautiful contry: I use that route once in a while going to see friends in North Salem. The Bowles have three teen-age sons and are both "moderately" active in civic work. Their avocation has been, for some years, modernizing a house in Rye and in building the new home in Ketonah. Their favorite vacation spot is the Virgin Islands. Vern hopes that they will be able to attend the 35th come June.

Here's one that has been kicked around since May and it deserves mention, a card from Dupuy F. Cayce, VI-A. The card got sent, (by me) by mistake, to the Course Secretary, who promptly returned it with a short reproof! How right he was. Dupuy was, and is one of our own boys and not an import. After 21 years with the Bell System, he looked for greener pastures and chose Arizona. That was ten years ago, and he went with the G. E. Computer Department, and for several of the ten he has been in Data Communications discussing and demonstrating the D. C. with many, many visitors, not a few of whom are M.I.T. Alumni. . . . Here is another from Course VI, Bill Gray, who I suspect is an Army career man, though I had then only an APO address for him. However, he is now back in the U.S. for good and not necessarily retired. He is back home after several years working with a "supposedly friendly" government; no particulars. Bill will definitely attend the 35th with a newer wife, a beautiful grandmother from Virginia. Please, a comment is indicated. Bill, we all are sure to understand what a new wife might be, but what is a newer one? A reply is expected, and our very best wishes to the happy couple. Now a word from Cal Mohr who comes through as always, but this time with news about Cal and none about other classmates: and this is unusual. Cal will not attend the Class Officers Conference unless he finds some excuse to get the expense onto the swindle sheet. The time is also apparently a factor. However Cal is going on a marrying spree, not himself of course but a nephew in Rochester, N.Y., and a niece in East Liverwurst, Ohio. He will surely turn up much news in Rochester, as it is a hotbed for 1933 chemical engineers. By the time this issue is history, we will know how Cal made out canvassing the Chicago Club area for 1933 brothers to attend the October 25th meeting of the Club, and then the next June 35th Reunion. Jim Turner is, and will be, assisting Cal in his great try to line up the faithful. Cal should be able to add a dozen to 15 more to the reunion cause.

We have quite a few address changes,

addresses on request: Jack F. Andrews (newly wed), XV; Harold J. Baker, Jr., X: George H. Bartlett, XV; Frank J. Bleil, VI; Harold G. Conger, I; Lloyd N. Combs, X-A; Frank S. Coyle, II; John P. Dahlberg. I: Walter J. Farrell, II; Leslie S. Fletcher, II; William A. Gray, VI; Dr. Lawrence C. Kingsland, X; Robert B. Mills, IV; Stephen Rhodes, II; Robert C. Rogers, XIII-C; Carlo H. Rumazza, IX-B; Philip C. Rutledge, I; Richard S. Rowe, IV; Kenneth A. Sawin, IV; Douglas M. Stewart, I; Robert Swain, VI, our new Class Agent; Harris A. Thompson, IV-A. ... Again we are saddened to have to report the passing of some of our good friends; four since our last Issue: John F. Bassett, Course II; Stanley A. Gilbert, III; Willard J. Hall, I; Dom Martino, IV. All but Willard Hall are recent deaths, and we waited six years before we heard about his passing. If and when you hear about one of these occurrences, won't you send in the word with what information you may have to me? I will see that the Alumni Office is notified at once.

Here again we start the monthly plug for the coming 35th Reunion. I have to revise my earlier statement about the number committed. It stands at just under 100, maybe 92 or so, who have signified their intentions to definitely attend the Reunion. There will be more, of course, and there will be some casualties, for reasons unknown as of now. But 90, plus wives, and a few grandchildren could make it well over 150, which is then better than the 30th if I remember correctly. Just as an aside, I ask in all sincerity that the faithful who will write for any one particular issue, please allow six weeks plus time for me to translate and paraphrase. It is better to write a little, often, than otherwise. For the record I have heard from or about just less than half of our Class in the last two years. That is not enough. We want them all to write, to alter a presently famous slogan. That's it, and many thanks for being patient. Yours most sincerely—Warren J. Henderson, Secretary, Fort Rock Farm, Exeter, N.H. 03833

35

Many of our classmates answered the brief questionnaire which was part of the bill for class dues sent out a year ago. Each month during 1967-68 we shall include in these class notes excerpts from their responses: Arthur S. Hamilton, "Just ourselves to care for again—so pleasant trips occasionally such as Skyline Drive last spring, and out to Myrtle Beach, then a week in Vermont's fall color. I keep busy as a consulting engineer and as President of Ropac, Inc., Rochester, N.Y., a small business which I operate in the field of tools and parts for machinery used to produce corrugated boxes." . . . D. Kenneth Finlayson is Vice President of Scientific Design Company, New York, N.Y., and his hobbies are golf and fishing. He wrote that early this year he had a get-together with Walt Marshall, Cagey Holdom, Zay Curtis, Bernie Nelson and wives. . . . Donald B. Wood lives in Corpus Christi, Texas, and



Charles W. Smith, '35, (right) and Thomas C. Mayers, Mayor of Stamford, Conn., break ground at the 60-acre site in Stamford where Olin Mathieson Chemical Corporation's Chemicals Group will build offices for executive and administrative personnel. Smith is Executive Vice President of the Chemicals Group.

had the thrill of shooting a bear in.
Alaska. . . . Prescott A. Smith wrote from Cambridge, Mass., "After 21 years commuting to country accepted invitation of Dean to be Faculty Resident of Bexley Hall, smallest dormitory (in its 4th year) at M.I.T., 126 undergraduates, male. Eloise and I have been totally busy this fall moving, settling, entertaining 600 guests, mostly students, and learning new aspects of life here on campus. It is a very satisfying involvement."

Since the last appearance of these notes several changes have been made in the roster of our class officers: Hamilton H. Dow is now Vice President for the West Coast, and Phoenix M. Dangel replaces him as Co-Secretary. . . . Allan Mowatt summarizes the golf new as follows: "To bring you quickly up to date on the 7th Annual Class Golf Tournament, it is now a certainty that the winner this year will have a second leg on the President's Cup. (The first to win it three times gets to keep it). The finalists this year are the present champion; Ham Dow, and Bob Anderson the 1965 winner. In the Consolation Flight the finalists will be the winner of a match between Sam Brown and Sid Grazi vs Al Johnson. The other two contestants in the semi-finals of the Championship Flight were John Kiker and Allan Mowatt. They lost to Ham and Bob respectively." . . . Your Class Co-Secretaries end the notes for this issue with a plea for letters from all of you. If we don't hear from you directly, we'll probably distort what we do learn about you or concoct lies if we don't hear at all-Irving S. Banquer, Co-Secretary, 20 Gordon Road, Waban, Mass. 02168: Phoenix N. Dangel, Co-Secretary, 329 Park Street, West Roxbury, Mass. 02132

36

Alumni Day found several members of the Class in Cambridge although I did not personally see all of those whose names were on the list of registrants, so I can not vouch for their actually being there.

The group included Ed and Rose Dashefsky, Vince Estabrook, Hal Miller, John Myers, Frank Parker, Harry Foster, the Ben Coopersteins, and Herb and Kitty Borden, in addition to your Secretary. . . . Through the summer the list of address changes has become longer and longer. I will include the significant ones in next month's notes so you will have them in time for Christmas cards.

Several notes were sent in with contributions to the Alumni Fund, and I herewith share these nuggets with you. Albert Del Favero writes from Nashville, Tenn., that he is still with the Oman Contsruction Company, but included a brochure on a project which he claims is taking all his time and money. This is the operation of the Bucksnort Trout Ranch for family fishing fun "No catch, no pay." It is located on I-40 in Hickman County about an hours drive west of Nashville. Drop in any day if you are down that way. Donald McMullin maintains an architectural office in Wellesley and reports a married daughter, a son in the Navy between graduation from Syracuse and attendance at the Sloan School. . . . James Baker writes that his oldest son graduated from Vanderbilt in June and was married immediately thereafter. A second son is also at Vanderbilt and a daughter in high school. . . . Constant Bouchard reports one of his hobbies is collecting and restoring classic cars. He is an executive engineer with Ford Motor Company.-Alice H. Kimball, Secretary, 20 Everett Avenue, Winchester, Mass. 01890

38

Appointing Lou Bruneau Chairman of the 30th Reunion, President Jack Bethel predicts that June 7-10, 1968, will be a memorable sabbatical for the Class of 1938! Chatham Bars Inn on the Cape from Friday afternoon through Sunday and Cambridge on the Charles on Monday add up to a bountiful replenisher for your nostalgia, gemutlichkeit, social prowess, intellect, therapy, ego, inspira-

tion, savoir faire, philosophia, mummeryor what have you that needs replenishing? Chatham Bars Inn was the scene of our 20th, in a part of the old Cape overlooking both Nantucket Sound and the Atlantic. Early June, moreover, finds just about all of the Cape still firmly under control of the stoics, with the hippie invasion a safe several weeks away (assuming your preference is the same as mine)! . . . But Paul Black will describe more of this to you as Chairman of the Publicity Committee. Paul's extrovertive responsibilities at Sylvania have kept him in continual touch with many of us, and sensitive to the evolution of value judgements. Assisting him are Frank Kemp President and Media Director of Compton Advertising, Inc., your Secretary Fred Kolb, and everybody's Secretary Don Severance! If your wife says, "I think it would be fun to go with you to Reunion-and will you introduce me to Paul Black?" this will be Paul's highest accolade!

Program Chairman Bob Johnson, assisted by John Cook and Frank Gardner, are detailing the gala events. There will be a Saturday night banquet with master of ceremonies and orchestra, as well as a Friday night overture, a clambake, and appropriate intermissions. Sharing the Inn facilities with us will be the Class of '33, and we propose to commune with them in the Friday icebreaking. Nauset and Orleans Beaches are right at hand, as well as infamous Monomoy Point; you may wish to fulfill a part of your citizens' responsibility by inspecting the national seashore. And Al Wilson as Sports Committee Chairman will titillate you with golf at the Inn and at Eastward Ho! Charlie King, Howie Milius, and Dick Young are assisting in the charge "to arrange suitable sporting functions." Howie has lined up tennis, swimming (and dramatics?); Charlie will lead the 4-mile-jog-before-breakfast; and Dick promises an inclusive study of other "sporting functions."

There will be souvenirs and door prizes, with Sol Kaufman as Chairman assisted by Haskell Gordon. Have you secretly hankered for something like the cardinal blazers sported by the Class of 1917? Sol and Haskell are debating the potential of some such identification for the Class of 1938! If you have an opinion, a preference, or an inspiration, they welcome your correspondence. And then there is Norm Leventhal, the first man you'll see at Chatham, Chairman of the Registration and Reception Committee. He will be assisted by Ed Hadley, Horace Homer, and Hal Strauss. Have you, by the way, cross checked your engagement book, your social calendar, and your office appointments to be sure that June 7-10 is inviolate? Last spring we had the opportunity to compare academia when our oldest daughter, Carolyn, graduated from Pembroke-Brown, Color and action flashed all over the summit of Providence's mount of learning as the Brown alumni from every conceivable class marched and countermarched for 2.5 hours of heraldic ceremony-validating the graduation of

the Class of 1967. (Do I hear a motion that we volunteer for such a display of cabalism by marching in Cambridge?) Among the spectators there were several familiarly welcome faces: Erling Helland, S.M. '40, and Thordis, from their city planning activities in Tulsa to witness the graduation of their son Doug: and Bill Pulver '39 and Adie, from their Buick-Chevrolet-sports distributorship in Millerton, N.Y., as sponsors and foster parents of a girl from South Africa! While Carolyn received her S.B. in applied math, her fiance Bob Grafton received his Ph.D. also in applied math. They were married in Rochester on July 8 and are now in Columbia, Mo., where Bob is on the faculty of the University of Missouri.

Alumni Day at M.I.T. produced barely a half-dozen to represent '38. Don and Phyl Severance were surrounded by Al and Lou Bruneau, Frank Gardner, George Beesley, and John Glacken! They discussed (1) what commitments kept away various of the old faithful, and (2) how much more populous it will be next year. Supplementing these reflections are two notes from the absentees. Walter Johnson comments, "In February 1966 I left private practice to join Charles T. Main, Inc., Boston, consulting engineers. Since November 1966 I have been HVAC Supervisor for the Pulp and Paper Division." . . . And Eric Nietsch reports, "I am currenlty Vice President, Robintech Inc. (formerly Robinson Technical Products, Inc.)-a growth company in the electro-mechanical field. Our son Ricky is about to enter Montclair High School. while daughter Betsy is active in Montclair's Kimberley School." . . . Art Gould, Chairman of the Department of Industrial Engineering at Lehigh University, and Dr. W. D. Lewis, President of Lehigh, received for the department the 1967 Education Award of the American Society of Tool and Manufacturing Engineers in Chicago in April. After several industrial assignments Art joined the Lehigh Faculty in 1947, and has been Chairman of the department since 1952. Art himself is the author of an industrial engineering textbook and of a number of papers for ASME, ASEE, and ASTME. The award "acknowledges the Department of Industrial Engineering and Lehigh University, whose academic leadership in the development of fundamental and dynamic curricula in manufacturing engineering has focused educational attention upon technological disciplines which are critical and basic to the manufacturing industries. . . . that the Industrial Engineering Department at the University has conducted research leading to many technical papers presented before leading societies, that large numbers of undergraduates specialize in manufacturing engineering at the University, and that the department offers an M.S. and Ph.D. degree program."

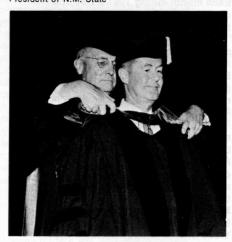
Art Rowley has been promoted to technical service representative by R. T. Vanderblit Company for the entire U. S. and Canada, specializing in wire and cable. Art has been assistant manager of the firm's East Norwalk laboratories,

and has been connected with the development and technical service groups of Vanderbilt since 1955. His prior rubber career includes experience with Uniroyal, Providence, R.I., and General Electric, Bridgeport, Conn. . . . Al Clogston has been busily reflecting the light of Bell Telephone Lab's academic torch into the darker corners. In May he conducted a colloquium at Harvard sponsored by the Department of Physics and the Division of Engineering and Applied Physics on the subject: "Giant Magnetic Moments in Palladium." At the Conference on Magnetism and Magnetic Materials in Boston in September he presented the review and tribute to the work of M.I.T.'s Professor John C. Slater, as the introduction to Professor Slater's invited paper, "Energy Band Theory of Magnetism." . . . We have a note on the death of Col. Bernard Card, in Largo, Fla., July 25. Bernard took his S.M. in Course I with us while on assignment from the U.S. Corps of Engineers, and continued in the Corps until 1948 when he was assigned to the U.S. Air Force. He retired from the U.S.A.F. in 1958, the year his son Bernard graduated from West Point. He is also survived by his wife Dorothy and a daughter, also Dorothy. . . . Watch the mailbox for Paul Black's Reunion mailing!-Frederick J. Kolb, Jr., 211 Oakridge Drive, Rochester, N.Y. 14617

39

Congratulations to Paul N. Stanton, II, recently promoted to president of Pratt & Whitney machine tool division of Colt Industries, West Hartford, Conn. Paul had joined Pratt & Whitney six years ago as Vice President, Marketing, Previously he had been with LaPointe Machine Tool Company, Hudson, Mass., as Sales Manager. . . . Brig. Gen Leo A. Kiley, X-B, who regularly appears in this column once and frequently twice each year on his steady rise up the military ladder, was appointed Director of Science and Technology in the office of the deputy chief of staff, research and development, for the U.S. Air Force

Leo A. Kiley, '39, (right) receives an honorary Doctor of Laws degree at New Mexico State University from William B. O'Donnell, Senior Vice President of N.M. State



effective July 1.... This note doesn't claim to give a complete rundown of Francis W. Sargent's, IV, political activities, but a clipping from a Geneva, Ohio, newspaper indicated that our Massachusetts Lieutenant Governor classmate recently was the GOP banquet speaker at a Republican fund raising banquet for Ashtabula County, Ohio. A short note from Leonard D. Jaffe, XIV, Jet Propulsion Laboratory, California Institute of Technology, indicated that since December of 1964 he has been Project Scientist of the Surveyor moonlanding project. . . . Another note, from Norman C. Chase, II, said that as of May 1966 he accepted the position of research engineer with E. H. Plesset Associates of Santa Monica, Calif., relocating there from Pasadena.-Oswald Stewart, Secretary, 3395 Green Meadow Circle, Bethlehem, Pa. 18017

40

Dick Feingold, '43, passed along the information that Marshall W. Roberts has been elevated to Vice President of marketing at Combustion Engineering's Utility Division. Marshall has been with Combustion Engineering since graduating from Tech. He started as a sales engineer, later became assistant general sales manager and then general manager of utility sales. . . . James Brewster submitted the note that he is Executive Vice President of Ziebart Rustproofing of New England. His company manufactures a vehicle rustproofing product which is based on a German patented process. It is the only one that offers a written guarantee against vehicular corrosion. . . . Clement Burnap, S.M., has just been promoted to Petroleum Service Programs Manager of the Ocean Systems Division of North American Aviation. His first service will be the leasing of manned submarines for submarine oil equipment work. . . . Bill Blattenberger passes on the note that his daughter Beth has just graduated from Swarthmore and has been granted a fellowship to study for a Ph.D. in economics at Tech starting in the fall. This is not quite following in her father's footsteps since Bill was one of the outstanding chemists in our

Jim Boulger, Jr., is an architect with offices in Salem, Mass. Last December Jim took a jet trip to Hawaii, the Philippine Islands, Vietnam and Japan as a refresher on modern and conventional architecture. . . . Herb Hollomon, who has been Acting Undersecretary of Commerce, has left Government service and is now President-Designate of the University of Oklahoma. . . . Bergen Suydam, Sc.D., is spending a year at the Culham Laboratory in Berkshire, England, working in plasma physics research. Bergen has been with Los Alamos Scientific Laboratory since August 1947. . . . Ralph Millet is President of SAAB. He joined SAAB as Purchasing Agent in 1947. ... Sam Goldblith was a member of the panel at the First International Agribusiness Conference in Chicago last May. Sam's topic was "The Opportunities for

the Food Industry in Helping to Meet the World Nutrition Problem." Sam is also the co-author of an article on the "Thermal Inactivation of Type E Botulinum Toxin" in the March 1967 Applied Microbiology. . . . George Stoner is Vice President and General Manager of Boeing's Space Division which was selected by the National Aeronautics and Space Administration to integrate the Apollo spacecraft and launch vehicle. . An article in the April 1967 Rubber World on the Columbian Carbon Division of Cities Service Company points to the outstanding work of Charles Stokes, Sc.D. He is General Manager of Research and Development.

Noble Jahnke is Materials Manager for Republic Foil, Inc.'s new aluminum rolling mill in Salisbury, N.C. . . . Latimer Jones dropped your Secretary a note advising that he is now Senior Scientist specializing in advanced development of the optical emission spectrochemical analytical instrumentation with Hasler Research Center of Applied Research Laboratories, Inc. . . . Jay Zeamer, holder of the Congressional Medal of Honor, two Silver Stars and two Distinguished Flying Crosses had the following observation to make in a recent magazine article: "You can always find a way to do anything you want if you are dead set on doing it, come hell or high ack-ack. I think that is the most valuable thing anyone can learn from life." Jay works for the Raytheon Company in its Bedford, Mass., laboratory and now lives in Groton with his wife and five daughters. . . . Wayne Stoffle has been advanced to the rank of Rear Admiral in the Coast Guard Reserve. He is a senior partner in the architectural firm of Stoffle & Finger.

It is with regret that I must record the passing of two classmates. R. Spencer Bailey who was with us in Course VI during our third and fourth years died January 30,1967. He had resided at 35 Lowell Road, Concord, Mass. . Courtland Hill died on August 2, 1967. His former address was 6818 West Devon Avenue, Chicago, III. . . . '40 had a small representation at the Alumni Day activities this year. Classmates present were: Mr. and Mrs. James L. Baird, Mr. and Mrs. Robert Bittenbender, John Danforth, Mr. and Mrs. Herbert Hollomon, Geoffrey Roberts, and Phil Stoddard.-Alvin Guttag, Secretary, Cushman, Darby & Cushman, American Security Building, Washington, D.C. 20005

41

Classmates attending the Alumni Day activities in June were Everett R.
Ackerson, Samuel K. and Mrs. McCauley, Edward R. Marden, John F. Sexton,
Charles W. and Mrs. Sauer, Irving and Mrs. Stein, D. Reid Weedon and Walter J. Kreske. . . . Rogers B. Finch has been made Director of Academic Planning of Rensselaer Polytechnic Institute. His office is now in Troy, N.Y. Rog prior to this had been located in Hartford, Conn., as Associate Dean of the Hartford

Graduate Center of Rensselaer Polytechnic Institute of Connecticut. The new post involves long-range planning and institutional research. He is also still active in the Army Reserve where he holds the rank of colonel and a mobilization designation in the Office of the Chief of Research and Development, Department of the Army General Staff. His son David was married to Linda Baty last February, and his son John graduated from Ohio Wesleyan University in June, after which he entered the Air Force Officer Training School. . . . Zachary P. Abuza reports that the Abuzas have a "new baby" by the name of Cleveland Precision Casting Company which is a Shaw Process licensee and is undertaking the production of highly precise, high integrity castings. The company is located at 22290 Lakeland Boulevard, Cleveland, Ohio. Zack reports that the whole family is enjoying this new venture and has moved to Cleveland to be where the "action" is. Daughter Nancy is on a year's leave from Radcliffe and spent the summer as a guide at the U.S. Pavilion at Expo 67. . . . Mitchell J. Marcus, President of Production Systems, Inc., has, as of July, moved the company facilities to the Waltham Industrial Center located at 242 Second Avenue, Waltham, Mass.

Irving Stein, President of Cambridge Institute for Management Education, Inc., 2464 Massachusetts Avenue, Cambridge, has announced the offering of a new "learn by mail" package for management training. The course aims to train and re-train would-be and existing managers at a cost to employers of \$300 per student for a 20-week training period at its completion. The package is being sold directly to employers, and one of the selling points is that the employee does all the work on his own time. The method of instruction is by written analysis using the case method. Communication between student and staff is by mail. Irv states that this effort is to fill a tremendous existing vacuum in management training due to the relatively small numbers being graduated from the nation's business schools. He says that the course will be plugged initially in Greater Boston because "the competition here is so great that if it works here it will work anywhere." The aim is 15,000 students a year in five years.

Robert Wilson Blake has been named Chief of the newly-formed Building Systems Section of the National Bureau of Standards Building Research Division, Institute of Applied Technology. In his new position he will be determining feasibility, methods and procedures for conducting demonstration projects in federal construction. Bob had previously led a Department of Defense Systems Feasibility Study at NBS. Before coming to NBS he was a management systems analyst with the Defense Communications Agency, devising and implementing a management control system for the National Military Communication System Directorate. From 1951 to 1960 he was a construction engineer with Furman Builders and with Robert W. Blake, Inc., General Contractors.





Bruce H. Anderson, '42; Courtland D. Perkins, '41

James A. Creighton has been appointed to the post of Assistant General Manager of the Burns Harbor Plant of Bethlehem Steel Corporation. He was formerly superintendent of the strip mill division at the Lackawanna, N.Y., plant. . . . Stanley Backer presented a paper on "Textile Literature Problems Today" at the Symposium on "Information Storage and Retrieval-A problem For The Textile Industry" held at the 1967 Annual Meeting of the Textile Research Institute at the Hotel Commodore in New York City. . . . Charles H. King, Jr., was graduated from the Advanced Management Program of the Harvard University Graduate School of Business Administration last May. It is a 13-week program for executives. . . . Dr. Herbert N. Hultgren, Professor of Medicine at the Stanford University School of Medicine, has presented the results of his research in an article titled "Lessons From High Altitude." His research has been conducted since 1958 in Peru at an altitude of 12,100 feet. He says it has revealed that altitude sickness generally involves acute pulmonary edema rather than heart malfunction. Pulmonary edema is the movement of fluid from the blood into the air sacs of the lungs. The fluid acts like a saltwater and eggwhite mixture. It froths when the patient breathes and quickly "drowns" him. The symptoms of pulmonary edema-a persistent cough, shortness of breath after the slightest exertion, a gurgling noise in the chest, coughing up of blood-streaked sputum, and vomiting-usually do not appear until six to 36 hours after arrival in a high-altitude area, he wrote. These signs resemble those of pneumonia, but without chills or fever. When the danger signals occur, the patient should be quickly brought to lower altitude and given absolute bed rest with oxygen continuously administered. Recovery is usually complete in three days. The full article appears in the May issue of Stanford M.D., the quarterly magazine of the Stanford Medical Alumni Association.

Howard Samuels has appeared in a news report as being considered for appointment by President Johnson to the post of Undersecretary of Commerce. . . . Irving H. VanHorn, Jr., reports that his wife, Virginia, died last January after a long illness and that he has retired from Convair after having had two brain operations for Parkinson's disease. At present he is living with his two daughters in Hesperia, Calif., where he is continuing his rehabilitation. . . . Courtland D. Perkins was elected to the Board of

Directors of the MITRE Corporation, Bedford, Mass. . . . D. Reid Weedon, Jr., Senior Vice President of Arthur D. Little, Inc., was elected President of the Museum of Science, Science Park, Boston. Reid is a past president of the M.I.T. Alumni Association. . . . Donald D. Scarff has been appointed General Manager of General Electric Company's Consumer Electronics Division, head-quartered in Syracuse, N.Y. He was General Manager of Lamp Division at Nela Park, Cleveland, Ohio, since 1962.

Dr. Wilson R. Slaunwhite, Jr., has been named Research Director of the newly reorganized staff of the Medical Foundation of Buffalo. He was formerly principal cancer research scientist in steroid biochemistry at Roswell Park Memorial Institute. He is also research professor of biochemistry at the State University of Buffalo and an editor of the Journal of Steroids. . . . Arthur W. Weber, Corning Glass Works, Corning, N.Y., was elected a Director of the Junior Engineering Technical Society, 345 East 47th Street, N. Y. C. . . . Eugene A. March has been promoted to the position of Group Vice President of Crucible Steel Company. He was formerly Vice President, Operating Services. In his new post he will be responsible for the company's non-steelmaking operations, Trent Tube Division, Spring Division and Magnet Division, as well as its Crucan Division, Crucible of Canada, Ltd. He began his Crucible career in 1946 as a metallurgist in the Syracuse works and rose to assistant works manager in 1958. He was ap-

Three M.I.T. alumni had prominent roles when the Academy of Applied Science of Cambridge presented its Medal of Honor award to Walter G. Cady on the 50th anniversary of his experiments resulting in the first successful application of piezo-electrity. Dr. James R. Killian, Jr., '26 (left). Chairman of the M.I.T. Corporation, presented the medal, with help from Edward L. Bowles, '22, Emeritus Professor on Industrial Management. Robert H. Rines, '42, (second from the right), is President of the Academy.

pointed Vice President, Technology, in 1961.... Dr. George H. Vineyard was made Deputy Director at Brookhaven National Laboratory. He formerly held the post of Associate Director. He joined BNL as a physicist in 1954 and became Chairman of the Physics Department in 1961. He became Associate Director in 1966.—Walter J. Kreske, Secretary, 53 State Street, Boston, Mass.; Everett R. Ackerson, Assistant Secretary, 16 Vernon Street, South Braintree, Mass.; Michael Driscoll, Assistant Secretary, 63 Centre Street, Nantucket, Mass.

42

The big news for this issue is that our very successful 25th Reunion is behind us. 170 of our classmates and wives attended, and from reports a great time was had by all. The highlight of the Reunion was Ron Shanin's movies and lecture, Rivers of Fire and Ice. Class officers elected or re-elected are Jerry Coe, President; George Schwartz, Executive Vice President: Bob Rines, Al Goldis and Charlie Speas, Vice Presidents; Ken Rosett, Secretary; Dr. Marty Levine, Treasurer; and Paul Hotte, Class Agent. . . . A note from Harvey Kram gives some interesting coincidences. His son, Leonard, graduated from Columbia in June on the 25th Anniversary of our graduation from Tech and on Harvey's 25th Wedding Anniversary. . . . A note from Bernie Moulton gives his address as 1726 Maxwell Court, McLean, Va. Bernie left Tech the end of his freshman



year and attended the Naval Academy, returned to Tech and took a masters with Dr. Draper in the Naval post-graduate course in '51. . . . Bob Benware, Director of Philco/Houston Operations, announced the continuation of Philco's contract for engineering and other support of NASA's Manned Spacecraft Center. . . . Harvey Knox has left Aerosol Techniques, Inc., and is Area Director of General Business Services. . . . Vincent T. Elkind formerly with Colgate-Palmolive Company has been appointed Research Chemist for the Industrial Chemical Products Department of M&T Chemicals, Inc. at Rahway, N.J. . . . Lever Brothers Company's new President is Thomas S. Carroll who attended the Institute courtesy of the Air Force with our Class as a meteorologist in Course XIV.

Frank Hutchinson, who was one of the original faculty members at the formation of the Biophysics Department at Yale, was recently appointed Chairman of the Molecular Biophysics Department there. . Don Berkey is completing his term as Chairman of SAE Technical Board according to an enthusiastic article about his accomplishments in the July issue of the SAE Journal. . . . Bruce Anderson has been appointed Assistant Vice President of United Shoe Machinery Corporation's International Division. . . . Our other Anderson, Mal, was elected Chairman of the Transportation Equipment Committee of the Manufacturing Chemists Association. . . . This note is a little aged, but Ed Pepper was graduated last May from the 51st Session of the Advanced Management Program of the Harvard University Graduate School of Business Administration. I just could not pass over a milestone from up the river like this one! . . . At Bethlehem Steel Corporation John Briggs was elected to a newly created position, Vice President, Planning, and Assistant to the President of the Corporation. . . . Carl Meurk was appointed General Manager of Todd Shipyards Corporation's Seattle Division. . . . Walt Robbie, who is President of Eaton Paper Corporation, was appointed to the Urban Redevelopment Authority of Pittsfield, Mass. . . By the time you read this issue, Milt Platt, Vice President and Associate Director of Fabric Research Laboratories, will have received the 18th Annual Harold DeWitt Smith Memorial Medal given by Committee D-13 on Textile Materials of the ASTM. . . . The last, but by no means least, bit of news is that Charles F. B. Wilding-White was married to Miss Marie-Anne Greenough. The wedding was celebrated in Vietiane, Laos, where Charlie is an advisor to the Ministry of Finance for the U.S. AID. . . . Hope to have a more complete account of the 25th Reunion in our next month's notes. In the meantime, how about some letters with recent news to keep our column interesting.-Ken Rosett, Secretary, 191 Albemarle Road, White Plains, N.Y. 10605

43

The 25th Reunion looms as a distant peak

on the horizon amid clouds of faded memories. The road which leads to it is being well charted by Chairman Ken Warden, and we will attempt to guide you along its course in these notes during the next few months. Our Reunion was discussed thoroughly at the June Alumni Day by those present from our class: Jim Hoey, Ned Swanberg, Leo Fitzpatrick, Gene Eisenberg, Howie Mattes and me. From our vantage point as observers of this year's 25th Reunion and from Ken Warden's personal survey of the facilities on the campus, it has been decided that our class will attempt to reserve one of the motels near M.I.T. rather than the undergraduate dormitories for our housing accommodations. We have already planned a clambake on the North Shore. We will print a Reunion Class Book containing photographs and biographies and believe that, all in all, we will come up with four wonderful days for our classmates and their families next June. All of you, I am sure, are pleased that this important affair is again under the capable leadership of Ken Warden.

Gene Morrison was elected a Director of the Federal Reserve Bank of New York for a three-year term. He is President of the Orange County Trust Company in Middletown, N.Y. . . . Thomas Mitchell was appointed a senior research associate in the Research Laboratories of Tennessee Eastman Company, Kingsport, Tenn. He joined Eastman as a process engineer at Clinton Engineer Works at Oak Ridge, Tenn., and later served with the Tennessee Products Division of Eastman Kodak Company's Research Laboratories in Rochester, N.Y. At the time of his new appointment he was serving as Superintendent of mechanical engineering. . . . Leo Feuer, a Director and Head of Research and Development for the William Carter Company, was appointed Executive Vice President of the firm at a meeting of the board of directors, according to an announcement by Lyndall F. Carter, President. In his new position he assumes management responsibility for all aspects of the company's operation, reporting to the president. Leo joined Carter in 1957 as a development engineer. He became Director of Research and Development in 1966 and was elected to the company's board of directors in February, 1965.

Melville Clark, Jr., has joined NASA's Electronics Research Center, Cambridge, as a physicist in the Physical Electronics Branch of the Component Technology Laboratory. Before joining NASA Dr. Clark was a senior consulting scientist at Avco Corporation for three years and a senior engineering specialist at Sylvania Electric Products Inc. between 1962 and 1964. A former Associate Professor of Nuclear Engineering at Massachusetts Institute of Technology, Dr. Clark specializes in plasma physics, nuclear reactor engineering and neutral particle transport theories. He received his doctorate and master's degree from Harvard University and his bachelor's degree from M. I. T. He is a member of Sigma XI, the American Physical Society, the



Benjamin Parran, '43

American Association for the Advancement of Science, the Acoustical Society of America, and the American Symphony Orchestra League. Dr. Clark holds patents and has published a number of technical papers and reports. He lives at Cochituate. . . . Jack Kelly has been named Manager of Supply and Transportation for Esso Standard Eastern Inc. in New York City.

Benjamin Parran, a Xerox Vice President, has been named Operations Manager of Xerox Corporation's Information Systems Division responsible for the engineering, manufacturing, control and personnel functions of the Information Systems Division. Prior to this appointment he was Vice President and Manager of the Information Systems Division's Engineering Department. . . . Albert Bakker sent us the following note, "I have left Buffalo, N.Y., and Shearson, Hammill & Company, Inc., for sunny South Florida where I am now associated with Hayden, Stone Inc. in their Sunrise Boulevard office, Fort Lauderdale. I will be happy to serve in this area on Class matters and Alumni Fund activities." . . . Walter Sutton, Jr., was appointed Vice President and General Manager of MEVA Corporation, a subsidiary of Hughes Aircraft Company. MEVA is an electrical contracting company operating in major cities across the country. . . . U. S. Navy Captain Dick Henning wrote, "In a letter which my wife, Jean, received from her Alumnae Association I discovered that Wellesley and Tech are exploring the feasibility of cooperative programs. After 18 years of marriage and three fine children I can heartily endorse a program which merely extends one that many of us instituted years ago."

We were pleased to receive an announcement of the marriage of Israel Lenzner and Mrs. Doris Silfen in White Plains, N.Y., on July 1, 1967. They are at home on Crawford Road, in Harrison, N.Y.... Ned Swanberg, our Class Gift Chairman, returned September 1 from a rain-soaked vacation in Nantucket, full of vim and vigor, and immediately instigated a back-breaking program of fund solicitation which, according to the press releases, will result in our Class achieving a new record in 25th Reunion gifts. Now is the time for serious soul search-

ing, the time to show, through a gift of capital, our thankfulness for the rewards we received through M. I. T.'s investment in us. We have discovered that many of the major gifts to date have been through transfer of stock certificates, thousands of which have been accumulated by members of our class. Power of Attorney forms for such transfers to M.I.T. are available at your broker's office.

Kemp Maples has resigned as Vice President of our Class after having served over 15 years in all of our activities. Class President Jim Hoey will announce Kemp's successor soon. Our Assistant Secretary for the Midwest, John McDonough has moved to Jacksonville, Fla., where he is with the Moore Dry Kiln Company. I had a wonderful chat with Chris Matthew when I was in San Francisco in June. I had hoped to meet with Chris and Rudy Hurwich during my trip there, but both of them were tied up with high school graduations, etc. Shirley and Gene Eisenberg, Jim Hoey and I assisted at the Class of 1942 25th Reunion where we were invited guests. That Reunion was a very splendid affair, and all attending had a grand time. We learned quite a bit.-Richard M. Feingold, Secretary, Ritter & Berman. 266 Pearl Street, Hartford, Conn. 06103

44

The Review Editor has asked Class Secretaries to keep the notes short this month relative to the material which has accumulated over the summer months. These notes cover the period from mid-May to mid-September. On May 23 I got a phone call from Paul Heilman of our secretariat. He was in Washington for the Water for Peace Conference and had just heard President Johnson (Lyndon, not Howard). Water for peace? Was Paul still with the Copper Development Association? I finally got it. Copper for pipe, pipe for water, and water for peace. All very logical. At lunch Paul told me of seeing three of our classmates on his travels. In Los Angeles he talked with Sten Hammarstrom and learned that Hammarstrom Controls. which Sten founded in 1964, was now in the profit column. In San Francisco Paul met Waite Stephenson, and they went for a sail in Waite's boat. The wind was strong and the chop light, "It was a great two hours," reports Paul. He added that Waite's wife, Mary, has gone back to teaching and loves the challenge. Back in New York City Paul saw Jay Martin of Weston, Mass., at the Design Engineering Show, May 15-19. Paul reports that Jay left A. D. Little Company, about three years ago to form the Spider Company which manufactures precision tools. Jay had several lathes set up at the show and was operating them. As reported in the July notes, Jay is Chairman of the Arrangements Committee for our 25th Reunion. . . . We move forward now to Alumni Day which was held June 12. I was not there nor was Paul Heilman who gave an account of news gathered on Alumni Day

1966. However, the list of those present shows that Jay Martin was among the seven members of our Class who turned out. Traveling the longest distance for Alumni Day were Mr. and Mrs. Robert M. Copsey, 5515 Paradise Valley Road, Calabasas, Calif., 91032. All the others were from Massachusetts. Two of those present have made it for at least two years in a row. They are Robert J. Horn, Jr., and Joseph J. Snyder (with wives along). The others present were Mr. and Mrs. Alfred L. Hart, G. Norman Jennings, and Peter D. Matthews. Like Jay Martin, Pete lives in Weston and is on the 25th Reunion Committee.

During May and June we received four notes sent with contributions to the Alumni Fund. Harold A. Miller, XV, wrote in May that he had just been employed by Chesebrough-Ponds, Inc., 485 Lexington Ave., New York, N. Y., as Manager of Packaging Procurement. If any of us have ideas for new and/or unusual packages or packaging materials, Harold would be very interested to hear about them. . . . Mortimer W. Meyer, Jr., 66 Burnett Terrace, N.J. 07040, writes that his oldest son Bobby has been accepted at Columbia College. Mort himself has been re-elected to Executive Vice President of Anti-Hydro Waterproofing Company, Newark, N.J. . . Randall N. Pratt, 10 Glenrock Dr., Claymont, Del. 19703, says he is now President of the Delaware Astronomical Society. Apparently that is an avocation. He is a Senior Research Engineer, Industrial and Biochemicals Department, of the DuPont Company. He married Irene Schade in 1946. They have three children. The oldest is now majoring in art at the University of Delaware. . . Reg Robba, Vice President of Booz, Allen. and Hamilton, International, wrote on May 11, "I am presently at the Hotel St. George, Algiers, Algeria, on consulting assignments for the Algerian Government. I recently completed an assignment for the Brazilian government in Rio de Janeiro." It wasn't very long ago that Reg was working in the Washington office of Booz Allen and living in Annapolis, Md.

In the March notes I pointed out that we had several very active classmates in the Chicago area with Al Picardi as President of the M.I.T. Club there, Lewis Tyree as Secretary, and Robert Faurot as Regional Chairman for the Educational Council. The next month I reported that Bob had also agreed to serve as 25th Reunion Gift Chairman, I asked for more news from the Chicago area. What happened? We got Al Picardi himself. Near the end of May (after the July notes had been submitted) I received the following, "P & W Engineers is pleased to annouce the appointment of E. Alfred Picardi as Executive Vice President in Charge of Eastern Operations." In early July the Picardi's moved to a new home in Rockville, Md. Al had already made his mark for all to see before coming to Washington. It is the 100-story John Hancock Center in Chicago for which AI was the structural engineer. The July issue of the Review carries a picture of the building

and a brief write-up of its revolutionary structural design. The building is not quite as high as the Empire State Building (because of aviation restrictions) but is actually occupied to a higher level. As you might expect there is much drama in a project of this scope. Al told John G. Barmby and I of some of the problems and how they were solved when we visited Al and his wife, Mary, in August. Al is now Bob Faurot's man in Washington for the 25th Reunion Gift. Obviously, M.I.T. plays an important role in the life of the Picardi's. Their oldest son, Tony, is returning for his sophomore year after having toured Europe on a bicycle this past summer. Al and Mary attended the 1967 Alumni Seminar on "Cities in Crisis" held September 8-10 on campus. (They report that our 25th Reunion Chairman, Burt Bromfield of Weston, Mass, was there.) Al and I are working on a social get-together in the near future for all classmates and spouses in the Washington area. The fall beer party to be held September 19 by the Washington Club is expected to provide a rallying point. . That brings us up to the present, and as summer fades away it is time to wish you a Happy Thanksgiving.—Paul M. Robinson, Jr., Secretary, Information Systems Branch, Office of the Chief of Naval Operations (Op-90F), Pentagon 5E773, Washington, D.C. 20350, 202-697-2962 or 7710 Jansen Dr., Springfield, Va. 22150, 703-45-8580; Assistant Secretaries: Paul M. Heilman, 2d, Copper Development Association, 405 Lexington Ave., New York, N.Y. 10017, 212-867-6500 or 30 Ellery Lane, Westport, Conn. 06880, 203-227-3469 and John G. Barmby, IIT Research Institute, 1200 17th St., N.W. Washington, D.C. 20036, 202-296-1610

45

Our 25th Reunion, June 1970, is only 32 months away! Some of you may feel that this event is far, far away, but when you examine this date in the proper prospective such as the age and growth of your family or your own graduation 268 months ago, you will realize it is only around the corner. The 25th Reunion is only mentioned in passing as we all in the months ahead must devote our thoughts and money towards our 25-Year Gift. You, fortunately or unfortunately as the case may be, will be constantly reminded of this situation in the months to come. Speaking of reunions, Tom McNamara reports the following: "A select group of 16 journeyed to Bermuda and Hamilton's Princess Hotel for an off year reunion April 26-May 1. Those attending were: Ann and Bob Maglathlin, Louise and Tom McNamara, Barbara and Murry Moore, Janet and Charlie Patterson, Mary and Gerry Quinnan, Elaine and Bill Shuman plus Patricia, William, Paul and Robert Shuman. Charlie Patterson displayed his prowess and latent talents by shooting a 62 at Belmont, one stroke off the course record. By now Charlie should have received his "silver spoon award." Sam-Murray-Moore, Cdr. USCG, was particularly pleased to be off duty during the high winds, also the evening the

famous Talbot Brothers singled him out as the Maharaja of Mahador! Although the Shumans were late arrivals, their brood turned to and caught twice as many fish as all others combined. The McNamaras were greeted upon arrival home with the news that home had been burglarized in their absence. The group had such an enjoyable time in Bermuda that they had a pre-Alumni Day dinner at Boston's Maitre Jacques to view one anothers pictures and "swap yarns." This so-called reunion group has the travel bug and will be planning more trips in the future. Anyone interested in receiving information about future traveling reunions should drop Tom or me a line. Who is ready to go! The Bermuda group, minus the Moores; Louise and John Morrison, now teaching high school physics here in Connecticut's Fairfield County; Warren Smalzell; Jim Smith and Tom Hewson were the only ones from '45 at Alumni Day last June. Tom Mac reports that Tom Hewson cringed as the 25, 40 and 50 year gifts were announced.

Walter K. Kulesa has been named Assistant General Sales Manager, replacement sales, at Delco-Remy, a division of General Motors in Anderson, Ind. After Tech Walt received a masters in business administration at Columbia and since 1950 has spent his entire career with Delco-Remy. . . . Donald A. Ostrower, P.E., a partner in the firm of Vollmer Ostrower Associates of New York City, has been President of the New York Association of Consulting Engineers this past year. Vollmer Ostrower Associates specializes in the planning and design of public works ranging from interstate highways and parkways to bridges, golf courses, ski centers and state and minicipal parks. . . . David R. Clare, Executive Vice President, Operations, Johnson & Johnson, keynoted the AMA's EDP orientation or briefing sessions early August here in New York City. Dave also, as many of you know, is Greater New York Chairman of your 25 Year Reunion Gift Committee. . . . William F. MacKenzie who has spent most of his career with Pennsylvania Power and Light has served as toastmaster at the M.I.T. Club of Lehigh Valley's meeting the past several years.

All of you ex-U-12ers will remember Jim Mulholland's 10-44 of Voo Doo and Company 2 fame. A spring issue of the New York Times had a feature article on Jim's Hayden Publishing Company and the results of 40 employees' children descent upon the publishing house. The feature picture was James S. Mulholland, III, flanked by father, who is company President, and mother trying out daddy's desk. Having "been here before," young Jim pronounced himself bored by everything! Like father, like son? . . . Norma and Bud Hetrick of St. Louis, Mo., happily announced the birth of their first child, C. B. III, on May 15. Norma, in a separate note, reports that Bud is joyfully busy at work where he continues to operate Armstrong Cork's Midwest contracting business. . . . Richard C. Winkler has been elected Vice President

of Container Corporation of America. Dick joined the company in 1946 and was appointed Manager of the corrugated plant in Boston in 1953, being transferred in 1960 to Baltimore. Dick is now General Manager of the Eastern Division head-quartered in Philadelphia. . . . Capt. Max A. Eaton is now with the Naval Weather Service Command in Washington.

Sherry Ing continues to "manage" Hawaii! Sherry was recently appointed a Director of Aloha Airlines, Inc. . . . Joseph L. Nescheba reports that his son Michael has successfully completed his sophomore year at the Institute, Course I. . Irving Bersak has become an account executive in the Walston & Company office in Newark, N. J. Irving, who received a masters in meteorology, was a forecaster with the U.S. Weather Bureau and President of Film Presentation, Inc., prior to entering the investment business.... Business Week's March 4 issue's head article on Philip Morris detailed Hal Thorkilsen's approach to specialized sales. Basically Hal, as President of PM's American Safety Razor Company, could not use the basic Philip Morris sales force in selling his company's products. . . . James M. Barabee, Quality Manager, Bearing Division, Hoover Ball and Bearing Company, Ann Arbor, Mich., has been honored by the American Society for Quality Control with election to the status of Fellow. Jim helped develop in the early 50's statistical quality control methods for foundries. . . . Curt Beck is back at Cabot Carbon's Pampa, Texas, plant after a year's sabbatical at the Institute. . . Charles F. Street spent several days at last winter's Boat Show in the New York Colosseum in the Dyer booth promoting his Delta, a 19-ft., fiber glass, centerboard sloop. I have no idea how this boat designed by Chick has sold, but it can really move. Fran and I joined Chick, Helen Marie and the girls for dinner one evening, the high point of which was getting Chick and his daughters "lost" on the subway! Chick reports that he saw Jim Brayton, Marshall Byer who is still with IBM, at the show, also Ed Washburn of Ideal Windlass who is Vice Commodore of the East Greenwich, R.I. Yacht Club.

Fran and I spent two enjoyable days with Bobbie and Vince Butler when we were in California in late May. After a week of harassment and work the weekend at the Butlers Santa Cruz summer home was relaxing and enjoyable. As many of you might expect, Vince is far different at home than he has been at reunions. Yes, he is the devoted, docile husband and father you might expect! Vince and I did manage to place one of the famous Butler night phone calls to Julian Busby in Oklahoma, After listening to Buzz talk I know how we Easterners must sound when victimized by the Butler telephone credit card. You have read elsewhere of the Butler activities at the Alumni Officers Conference in San Francisco the end of September. Busby continues to live from his suitcase and Cadillac. Sinus problems caused the Busbys to sell their Corpus

Christi home and return to Jackson, Miss., Buzz' original home: unfortunately, the Buzz' wildcat activities cause him to be in the Texas and Oklahoma oil fields continually. In six months Buzz was home a matter of 8 days! Vince Butler advised that Lib and Jerry Patterson had been in California for about two weeks in early April. Jerry, I believe, attended a conference or seminar in San Francisco on steel fabrication and execution followed by the usual California sightseeing tour.

ADA-Pete-Crawford, a fraternity brother and initial classmate, recently received an electrical engineering degree from Stamford after a career with the Navy's Blue Angels. . . . An early spring note indicated that Jimmie and Tom Stephenson of Alcoa fame were to have been East this past summer; possibly the wet weather kept them away. . . . The March issue of Fortune's article on the need for EDP programmers mentioned how classmate John A. DeVries, an aeronautical engineer by training, was brought in as President of Computer Applications, Inc., a firm founded in 1960 that now has 2000 employees and "software" sales of over 18 million. . . . Ed Stoltz who has been with Johns Manville since graduation received his sixth relocation in early Spring. Ed, now living in Princeton, N.J., has been designated a project manager to determine whether J-M should enter underground high temperature piping market. If Ed can justify entry into this market, he will then become manager of the entire operation. All in all it sounds most intriguing. Ed's story of moving is too painful to repeat-quick sale, rentals, delayed furniture pickup and delivery, damage in excess of \$1000, etc. Princeton, N.J., is only 20 minutes from Johns Mansville's Research Center in Manville, N.J., and about 75 minutes from Ed's New York office. Ed has given up his Educational Counselor activities and transferred his midwest 25-year gift operations to Nick Mumford, we will have him working here in Greater New York! -C. H. Springer, Secretary, c/o Firemen's Mutual Insurance Company, 420 Lexington Ave., New York, N. Y. 10017

47

As I write these notes sitting beside a motel pool a week after our joyous gettogether at the New England Inn, my lumpy reminders of the infamous black flies are just about gone. For those of you fortunate enough to attend our 20th Reunion you have probably forgotten all about our winged friends and may be a bit hazy on some of the other happenings. To refresh your memory and for the benefit of those who couldn't make it let me try to cover a few of the hightlights. When Gina and I arrived after a bit of circuitous sightseeing (Franconia Notch, Old Man of the Mountain, etc.-the usual family map battle promulgated this side excursion), we were met at the cocktail lounge by the early arrivals. We were told that Carol and Bob Horowitz had arrived a day

earlier to partake of the lovely New Hampshire weather and scenery and to be sure of our accommodations. Also among the early arrivals those there for the start of cocktails were: Arlene and Al Pastuhov from Harvard, Mass.; Beverly and George Sweeney, Concord, Mass.; Evelyn and Tom Crow, Groton, Mass. These fellows plus Bob Horowitz, Parker Symmes and Jim Phillips made up our Reunion Committee, and before I forget let me say thanks from all of us for a fine job done. . . . Pat and Dave Knodel of Lexington, Mass., arrived as we did, and we joined Lois and Ken Marshall of Clayton, Mo.; Elizabeth and Larry Michel of Westport, Conn.; Carter and Alex Giltinan of Charleston, West Va. This mention of Missouri and West Va. shows that some of the group came some distance, and I was really impressed when I met Les and Carl Eyman from Thibodaux, La. I was informed however that Ginny Ferguson Hildebrand and Bob were on the way from Seattle (Ginny '47, Bob '45) but that our prize winner for most distance travelled was Joaquin Luis de Cunha e Silva Cardoso from Lisbon, Portugal. The Hildebrands brought their children as did Karen and Jack Rizika, the Crows and Betsy and Dick Mooney. I don't know how it ties together, but Jack is continuing as Class Agent and Dick is in charge of special gifts so you will be hearing from Boston and New Jersey frequently in the next five years. Thinking of children makes me realize that a few years have gone by since we left the Institute. Jim Phillips has one son at the University of Pa. and number two son was graduating from St. Pauls the weekend of the Reunion. Jane was involved in the graduation festivities so did not join us in N.H. I didn't catch the ages of all the children mentioned but did note that Dorothy and Jim Robertson of Chappaqua, N.Y., will have a son starting Harvard next fall and that Winifred and Hunter Bennett of Weston, West Va., will have a little one joining us about the same time. I didn't hear of any grandfathers as yet, and we still have some die-hard bachelors among us led by Prexy Claude Brenner who now sports a rather flashy moustache.

By dinner time Friday the group was rounded out by Helen and Jack Hill of Lincoln, Mass.; Arnie Varner of Newtown, Conn. (you will be hearing from Arnie in the coming months as he will be collaborating with me on these I hope monthly notes); Claire and Bob Seidler of Summit, N.J., whom we hadn't seen since spending a pleasant ski week together in Killington, Vt., two winters back. The dinner group was rounded out by Marge and Lee Schwarz of Lawrence, Mass.; Harriet and Ed Rosenberg of West Redding, Conn.; Lillian and Ed Meisner of Trumbull, Conn.; Sandra and Jack Karmazin of Grosse Ile, Mich.; Barbara and Paul de Mello of Burnt Hills, N.Y., and my old course XV mates Sid Grob with Edna from Lowell, Mass.; Jim Prigoff and Arlene from New Rochelle and Morgan Cooper with Daphne from Crystal Lake, III. As we were heading for bed Barbara and Jack Harvell were checking in mumbling about Boy Scouts and the

short trip from Lexington, Mass. Sometime during the night or Saturday Jan and Marty Phillips of Waltham, Mass., pulled in with the Bob Redikers of Newton. Bob is now a professor in Course VI at school. The last of the group to register were Annette and Oliva Anderson of Weston; Cornelia and Fred Veith of Old Greenwich, Conn., and Ginny and Bob Connors of Mamaroneck, N.Y. It was the first time I had seen my old section mate Bob in over 20 years. He is now a Vice President of Indian Head which was one of the companies discussed in the financial seminar at Tech on Alumni Day. You should have attended Bob!

Saturday was clear and hot and a real day for activities. One group left for mountain climbing about 6:30 A.M. Needless to say I didn't see them. Gina and I teamed with Jim Phillips rather perfectly to record a 29 net best ball on the Conway 9 hole course. Other golfers over the weekend were Les and Carl Eymans, George Sweeney, Arnie Varner, Lois and Ken Marshall, Larry Michel and Bob Hildebrand. At lunch we heard discussions of some great tennis by Arlene and Al Pastuhov, Claire and Bob Seidler, Bob Horowitz, Elizabeth and Larry Michel and Ed Rosenberg. Mind you it was a sunny 86 and this gang is gung-ho for tennis. Parker Symmes had a group doing some cool canoeing, and nobody fell in so was a fine success. The formal athletics culminated in the softball game between the "Haves" and the "Have Nots." The teams were designated as A-K and M-Z by Tom Crow. He never did explain what happened to L so in a way it was fortunate that Byron Lutman had to cancel out. It was amazing to see the group cavort in the field and on the bases as if the year were 1947 instead of 1967. The "Haves" came through with a close scoring victory with an inning of nohit pitching by Sandra Karmazin and helped by the inability of Jim Prigoff and yours truly to find the handle on the ball in the infield weeds. The rather festive cocktail party and banquet was ended with the informal athletic swimming meet about 3 A.M. This I understand was organized by the Sweeneys. I still contend I had nothing to do with it, honest. Sunday found a tired, happy and somewhat hung over group working their way South. Let's hear from you-Dick O'Donnell, Secretary, 28516 Lincoln Road, Bay Village, Ohio 44140; Arnold Varner, Harvey Hubbell Company Newton, Conn. 06470

48

A long letter from **Joe Corso** brings us up to date on his travels over the last few years. Although he still considers Fairfield, Conn., as his permanent home address, he is now (semi-permanently) at 1121 S. Paige, Apt. 201, Wichita, Kansas, for those who wish to drop him a line. From 1948 to 1951 Joe was with United Aircraft Research in Hartford. From 1951 to 1953 he attended Cornell and received his masters degree in aeronautical engineering. From 1953 to 1955 he was with Sirkorsky in Bridge-

port, leaving them in 1956 to join Development Designers of Morristown, Pa. Joe is their Manager for Aerospace Technology activities and is currently assigned to Beech Aircraft in Wichita. In July 1965 he married a Kansas girl, and early in 1966 they took a ski trip to Austria which resulted in Joe's becoming a devotee of that fine art. . . . Bob Stern has been appointed Executive Secretary of the new Committee on Public Engineering Policy of the National Academy of Engineering. He will also serve as Assistant Secretary of the Academy. Bob has been Chief of the Office of Industrial Services at the National Bureau of Standards since 1964 and for two years was Special Assistant to the Assistant Secretary for Science and Technology of the Department of Commerce. Bob writes, "I can also report that we are now a family of five with three children-Adam 8, Amy 7, and Mark 3. We live in a Victorian house in Cleveland Park." . David N. Schramm of Hazelwood, Mo., garnered M.I.T.'s top athletic honor, the Class of 1948 award. The 6' 3", 220 lb., three-times New England heavy weight wrestling champion, totaled an amazing 35-3 record in four intercollegiate seasons. Undefeated in his freshman, junior, and senior years, Dave rolled up 21 consecutive dual match wins during his past two varsity wrestling campaigns. An outstanding student, averaging 4.7 in physics, Dave is married and the father of a two-year-old son.

C. W. Tittle, Ph.D., now holds the titles of Professor of Physics and Mechanical Engineering and Chairman of the Department of Physics at Southern Methodist University. . . . Charles W. Adams, President of Charles W. Adams Associates, Inc., was one of the speakers at a management conference on The Computer Jungle held at Boston University on May 17. The conference was designed to define management's role in setting the objectives of an information system, explore the advantages and problems of computer-based information systems, and examine the pros and cons of inhouse computer facilities, service bureaus, and time-sharing systems. . . Albert J. Kelley has been awarded NASA's Exceptional Service Medal for his contributions to their electronics research programs. Al left NASA June 1 to become Dean of the College of Business Administration at Boston College. He now lives in Milton with his wife and three sons. . . . Ralph F. Cameron has been named Assistant Vice President of the International Nickel Company, Inc., New York City. He and his wife have three children, John F., James A., and Katherine R. . . . Gordon O. F. Johnson has been elected President of Log-Etronics, Inc. . . . Charles E. Rider has been promoted to Vice President, Administration, by Central Hudson Gas and Electronic Corporation. He resides at 62 River Road, Rhinebeck. . . . David A. Finnegan has been appointed to the position of Chief Chemist, Calendering Department, for Tenneco Advanced Materials, Inc., a subsidiary of Tenneco Chemicals, Inc. He and his wife live in East Greenwich, R.I., with their four children. Dave represented the United States at the 12th World Boy Scout Jamboree in Farragut, Idaho.

John M. Randolph and the company of which he is a co-founder and the President, Randolph Computer Corporation, were featured in an article in the May issue of Finance magazine. The article cited the company as a "convenient vehicle to illustrate the position of the [computer] leasing companies." Pete Richardson of the M.I.T. Admissions Department paid a visit to the Liberal Studies Program at Mt. Hermon this summer where your Secretary was a member of the faculty teaching a course in computer mathematics. . . . Frank E. Guptill, Jr., Senior Research Chemical Engineer at Texaco's Beacon Research Laboratories, is one of the two co-patentees of a recent patent assigned to Texaco and covering improvements in preparation of coal slurries. . . . Early in May the AT&T Company named Roy D. Watson as General Manager of its Central Area Long Lines' operations with headquarters in Chicago. Roy and his wife have three children, a daughter and two sons. . . . Michael J. Bajor was a candidate for one of three four-year term vacancies on the Hazel Crest, III., village board. The election was held on April 18, but we have not yet learned of the outcome. Mike resides with his wife and four children at 2618 Turtle Creek Drive. He is employed by Inland Steel Corporation in the quality control department. S. Hart Moore, S.M., and a Mr. Leon Brand have established the architectural firm of Brand & Moore. The firm is now engaged in the design of the Hunts Point Cooperative Market for meat and poultry at Hunts Point Avenue and the East River in South Bronx.

A Camelot-style birthday party was held in Concord in July in celebration of the birthday of U.S. Olympic skier George Macomber. The party was attended by Olympic skiers from many places and featured everything from that period of chivalry except Lancelot. Mrs. Macomber was the ingenious innovator and planner. . Blanchard D. Smith, Jr., S.M., has joined Applied Systems Technology of Vienna as Chief Scientist. He was awarded the Browder J. Thompson Award from the Institute of Radio Engineers in 1953. . . . L. A. Gould co-authored a paper entitled "Model Control of an Ammonia Reactor" which was presented in June at the 8th Annual Joint Automatic Control Conference in Philadelphia. . . . W. D. Kingery was coauthor of an article in the April issue of the Journal of the American Ceramic Society. . . . Dr. William J. Harris, Sc.D., Assistant to the Vice President, Battelle Memorial Institute, was one of the Co-Chairmen of a conference on Engineering and the behavioral sciences held July 31 to August 4 at the University of California at Santa Barbara. . . . The conference was designed to illuminate the potential as well as the actual areas for interrelationship between engineering and the behavioral and social sciences. . . . John E. Searle, Jr., has been promoted to general manager of the

Ucinite Company, Newtonville, division of United-Carr, Inc., Boston. He resides with his wife and two daughters on Brown St., Marblehead. . . . Glenn R. Hilst has been elected a councilor of the American Meteorological Society for a three-year term of office, 1967-1968. . . . Peter Thornton, new President of the sales promotion affiliate of Interpublic, Inc., was spotlight speaker at the annual meeting in June of Envelope Makers Institute of Canada. . . . John C. Avallone has been named General Manager, Special Products Operation, of the Lighting Products Division of Sylvania Electric Products, Inc.

Thomas Kirkman is a Vice President of lonics, manufacturers of water-desalting equipment. . . . Attending Alumni Day last June were the following members of Class of 1948: Mr. and Mrs. R. Ellsworth Annis; Mr. and Mrs. Richard Baker; S. Martin Billett: R. H. Bliss; Mr. and Mrs. Kenneth S. Brock; Mr. and Mrs. George Fountas; J. Karl Justin; Richard H. Harris; Albert J. Kelley; Mr. and Mrs. Robert F. Lovezzola: Arthur F. Muldoon; William Oard: Mr. and Mrs. Norman L. Seltzer; Mr. and Mrs. Theodore R. Yoos, Jr. . Karl Justin has been made a partner in the New York architectural firm of Fordyce & Hamby Associates which does design work of industrial plants and technical facilities. . . . Robert W. Deutsch has formed General Physics Corporation, an organization that performs nuclear analyses for government and industry. He is also Professor of Nuclear Science and Engineering at Catholic University, Washington, D. C. . . . Cdr. Glen G. Macon retired from active duty June 30. . Richard A. Snow reports that construction on a new B. F. Goodrich canvas footwear plant at Lumberton, N. C., was begun in November 1965. He was officially assigned to this new facility on January 1, 1966, as Technical Manager. He and the family moved to Lumberton in July of 1966. . . . Jack P. Kourkene writes: "Have been granted two U.S. patents for concrete prestressing systems through post-tensioning and am searching for nationwide licenses. Patent numbers are 3,225,499 and 3,307,310. Anyone interested please write to. . . . " His address: 3559 Jackson St., San Francisco, Calif. 94118.

Juan C. Grau, in making his contribution to the Fund, writes: "I am proud of M.I.T., and I only hope that in the future my contributions may be more compatible with all the good that I have derived from my education at Tech." . . . Major Bruce E. Morrell is now serving as Assistant Professor of Aeronautics at the United States Air Force Academy. . . . Daniel R. Muss is now Manager, Silicon Device Development, at the Westinghouse Research Laboratories. . . . Gertrude S. Burbank is now working in Albany, N.Y., with the N.Y. State Education Department as a Senior Architect in the Division of Educational Facilities Planning. She and her husband have four school-age children: Wendy, Frederick, Rosalind, and John. . . . Edward C. Mack, 3rd, is working at the Clifton Adhesive Company, in Wayne, N.J., as a chemist. Our

congratulations to Ed who recently married the former Elizabeth B. Mullaney. .. Leo J. Martin has been made General Manager, Plastics Division, of General Box Company. Leo reports a new son, Douglas Richard Martin born in 1966. Congratulations, Leo. . . . William C. Krutzsch is Mangaer of Engineering, Pump & Heat Transfer Division, Worthington Corporation and President, Suburban Flying Club, Inc. Morristown, N.J. He and wife Muriel have two children: Linda 9 and Karen 5. . . . William J. Emrich is with McClelland Engineers, Inc. He and wife Mary Louise have two children: William J., Jr., 15 and Charles R. 9. Jack Kearney is Supervisor of Melting Services at Corning Glass Works. His chief hobbies are skiing and golf. He and Barbara have five children: Jim 10, Bob 8, Steve 6, Peg 5, and Carol 3.

Arthur J. Sable is with IBM in Boulder, Colo. He and Mary have a daughter Hannah, age 11/2 years as of May 1967. . . Ellarson R. Stout is with Elmer Corporation, Wilton, Conn. He and Marilyn have three: Wendy 11, Melanie 8, and David 3. ... Robert G. Phillips is with Xerox Corporation and belongs to the Retired Officers Association (retired, U.S. Navy), AFCEA, and American Management Association. He and Betty have two: Kathe 20, and Bob Jr., 19. . . . Charles A. Gibbons, S.M., is with Havens and Emerson, Consulting Engineers. He and Helen have two children: Laurie Kay 15 and Charles 13. . . . Ira Robert White is a graduate student in physics at Oregon State University. He and wife Margaret have two children: Linda 6 and David 4. . . . Robert H. Gould is retired and enjoying his hobbies, sailing and traveling. His address: c/o Malaspina, Tulip Lane, Westport, Conn. . . . Angelo Giambusso is Assistant Director for Project Management, Division of Reactor Development and Technology, U. S. Atomic Energy Commission, Washington. He reports his hobbies as golfing and fishing. He and Theresa have two children: Frank 19 and Scott 14. . Arthur S. Davis is Marketing Manager, Latrobe Steel Company, Latrobe, Pa. 15650. He and wife Elaine have two children: Patricia 17 and Alison 13. . Harvey B. Willard and Isabella are proud of their Karl 15 and Karen 14. He is Chairman of the Physics Department of Case Western Reserve University. . Stephen T. Davenport, whose hobbies are world travel, skiing, and golf, is with the Pipeline Division of Bechtel Corporation. He and wife Patricia have three: Diana 15, Stephen Thomas, Jr., 13, and John 10. . . . Robert Schneider, wife Judith, and Tami 8 and Dall 6 make their home at 62 Meadowoods Road, Lake Success, N.Y. 11020. He is with American Bosch Armco. . . . Samuel N. Karrick, Jr., is Deputy Director, East Asia and Pacific Region, Office of the Assistant Secretary of Defense, International Security Affairs. He served on the staff of the Ambassador in Saigon on counter-insurgency affairs from August 1965 to March 1967. He and wife Marian have three children: Betty 17, Sarah 15 and Margaret 10. . . . Alfred G. Baum and wife Corrine have two offspring: Milton 8 and Kathy 41/2. He is Staff Engineer, Industrial Technical Center, the Lummus Company (Newark office). —Robert R. Mott, Secretary, Kent School, Kent, Conn. 06757; John T. Reid, Assistant Secretary, 22 W. Bryant Ave., Springfield, N. J. 07081; Richard V. Baum, Assistant Secretary, 1718 E. Rancho Drive, Phoenix, Ariz. 85016

49

Although it will be 19 months away by the time you read this, your Class officers are beginning to plan our 20th Reunion. To this end, Stan Margolin called me the other day to ask how I thought Bermuda sounded as a location. Bermuda sounds great to me, but Archie Harris who dropped by with his fine family recently said that if we are going all that distance, it better not be for just the usual three days but for a whole week. So that's what the dreamers on the Reunion Committee are dreaming. Other locations will be duly reported here if this one doesn't seem good to enough people. . . . Back in the spring a number of you sent brief notes to me with personal news. These little messages are much appreciated, and here is what they said: Theodore Moreno, Sc.D. '49, has been promoted to Vice President, Equipment Group, Varian Associates, Palo Alto, Calif. . . . Barbara Feeney Powers says: "I am now the Administrative Assistant at Keith Country Day School in Rockford, III. This is in addition to my duties in the science department at Keith and coupled with maintaining home for Lee and five children, I am a busy gal." . . . Frank Brunetta recently joined Pepsi Company, Inc., as Assistant to the Chairman of the Board. Frank lives at 1 Old Oak Court, Syosset, N.Y. . . . Paul C. Johnson writes: "At the end of June ('67) Mitre is transferring me (from Burlington, Mass.) to Patrick Air Force Base, Florida, where we have a department supporting the system planning for the Air Force National Range Division." . . . Theodore R. Madden is now a full Professor of Geophysics at M.I.T.

William C. Schneider reports that he is still with NASA but no longer Mission Director for Gemini; instead he is now Mission Director for Apollo Applications Missions. . . . Lt. Col. Herbert Federhen was finishing up his Ph.D. work at the University of Michigan in June although on active duty with the U.S. Army. He is now (September) in Korea. ... Robert E. Dohenv is President of the Doheny Oil Corporation in Ballston Spa, N.Y. He married Winona Bryan in 1953, and they have three children, Kathleen Winona 12, Richard Edward 8, and Steven Bryan 6. . . . Harold E. Rorschach, Jr., has been appointed Chairman of the Physics Department at Rice University, Houston, Texas. . . . Paul G. Miller has been elected Vice President of Control Data Corporation, Minneapolis, Minn. He is also General Manager of the Special Systems Group which includes four divisions of the corporation. . . . Adrain E. Johnson, Jr., S.M. '49, recently left Union Carbide after five years where his last position was Manager, Engineering Science Department, Management Services, Union Carbide Corporation, 270 Park Avenue, N.Y.C. He has joined Realtime Systems, Inc., 866 3rd Ave., N.Y.C., as Staff Consultant in Process Control and Management Science, specializing in mathematical modeling and optimization. . . . There is much more, but it will have to keep until next month.

—Fletcher Eaton, Secretary, 42 Perry Drive, Needham, Mass. 02192

51

The rainy season appears to be letting up on the East Coast, children are getting ready to go back to school, and the realization of another rapidly receding year adds to the feeling that along with the decrease in the value of the dollar, and the shrinking of the world through supersonic travel, the one-year time increment appears to be getting shorter as we get older. Welcome back. In the news: Sylvia and George Field are living in Berkeley, Calif., where George is a Professor of Astronomy at the University of California, Berkeley. The Fields have two children. . . . Bachelor Art Geary is working for Brunswick at their Needham, Mass., research laboratory. . . . Frank Heart is an Associate Group Leader in the Surface Techniques and Equipment Group of M.I.T.'s Lincoln Laboratory's Communications Division. He joined Lincoln Lab. after graduation when it was the M.I.T. Digital Computer Laboratory. . . . Henry Jex was written up in IEEE Transactions on Human Factors in Electronics. Hank is with Systems Technology in Hawthorne, Calif. We had been receiving the Jex annual Christmas letter which was chock full of news, but I think that he forgot us last year. Will you put us back on the mailing list, Henry? Incidentally, to any of you who also send out a reproduced Christmas letter, would you please send a copy to the Class Secretary; it is a convenient way for both of us to convey and receive Class news. . Nathan Kirschbaum is with Grumman Aircraft Engineering Corporation. He and Irene live in Huntington, N.Y., and have two young sons. . . . The A. R. Larsen Company, a major supplier of graphic arts equipment, has moved to new and larger quarters in downtown Boston. Al had been a group leader at Raytheon until 1961 when he entered into this venture. A recent article indicated that AI has built up a reputation for quality service which has been a major factor in the growth of his company. Al and Esther live in Wakefield, Mass. By the way, Al is the one responsible for putting together the class statistics for our reunions. . . . Robert Lubker is a Project Engineer with Metcalf & Eddy. Bob and Carolyn have three sons and live in Wellesley, Mass. . I have a note from Robert McPherson dated May 4, *117E, and he notes that advances continue in Duodecimal Development and Applications despite widespread propaganda promoting the metric system. I promise to follow this up in a future column, but in the interim anyone interested in the Palm-Pint-Pound Do-Metric system should write to the Duodecimal Society of America, 20 Carlton

Place, Staten Island, N.Y. 10304. (The asterisk in the date indicates the duodecimal system). . . . Dr. Irwin Manning is with the U.S. Naval Research Laboratory in Washington, D.C. Irv's family includes Emily (1 year in September) and wife Amelia (Young). . . . Madge and Martin Miller have one daughter, Jennifer, and they are living in New York. Marty was Vice President of Adam Hats, Inc., and head of the Adam Hats International Division, but in this age of mergers and acquisitions, I can only assume that this still holds until I hear more extensively from Marty.

Vincent Milone is with the Ministry of Lands and Housing, Ibaden, Nigeria. . . Milton R. Neumann is President of Neumann Engineers in Blythe, Calif. He and Gay live in El Centro with their three children, ages 13 to 10. . . . Russell Osborn, Jr., is with Jarrell Ash's overseas division located in Switzerland. Clair Parker, Jr., is Laboratory Manager at Melpar in Falls Church, Va. The Parkers also have three children. Also at Melpar are two other classmates: Henry Hahn and Thomas Meloy David Prophet, single, living in Panorama City, Calif., is a Research Scientist in the Life Sciences Division of Lockheed-California in Burbank. . . . George Shumway had been in the publishing business. but a fire in 1965 destroyed his home and associated office. He has rebuilt but still trying to recoup. . . . Louis Stern is still with the New York office of Dames & Moore, Consulting Civil Engineers. The Sterns live in Summit, N.J., have twin boys, 10, and a third son aged 6. . . Frank Tully was promoted to Vice President, Product Engineering, at Motor Wheel Corporation. Frank had been Director of Product Engineering. . . The Bob Wedan mystery of about a year ago seems to have cleared up with his settling in Lynnfield, Mass. Bob is now Chief of the Guidance Systems Branch at NASA, ERC, Cambridge, Mass. Bob and Elaine have a daughter, Judy (17) and two sons: Robert, Jr. 14 and Stephen 12. Bob's hobbies include flying, sailing, and music (he flew up to our 10th Reunion from Florida), and he is also busy with the Institute of Navigation and the Alumni Fund. . . . Gordon Zucker is with Union Carbide Electronics in Greenville, S.C., where he is active in R & D of capacitor and resistor materials. He and Phoebe Sue have four children. (Seems to be the norm in our class.) Gordon asked about some of the mineral engineers in our class and outside of T. P. Meloy (mentioned earlier), Doug Kaufman (at Nuclear Metals Division Whittaker Corporation,

John G. Sample, '53; Robert L. Stern, '48





W. Concord, Mass.), and Bill Krivsky (Vice President Continental Copper & Steel Industries), I really haven't heard from many of the group. Would Greenwalt, Servis, Landers and Binns step forward please?—Howard L. Levingston, Secretary, 358 Emerson Rd. Lexington, Mass. 02173; Marshal Alper, 1130 Coronet Ave. Pasadena, Calif. 91107; Walter Davis, 346 Forest Ave. Brockton, Mass.; Paul Smith, 11 Old Farm Rd. N. Caldwell, N.J. 07006, Assistant Secretaries

53

Another summer is over. Here in Boston it has been without much sunshine, but there is always next year! I hope that these notes find you all in good health and spirits. Charles A. Homsy, X-B, forwarded a very interesting piece out of the Houston Post entitled "Doctors and engineers team up at Methodist (Hospital) to develop new devices to ease joint sufferers." Charlie is the new director of the orthopedic prosthesis program at the recently completed \$10,000,000 Fondren-Brown Orthopedic and Cardiovascular Research Center of the hospital. The work involves close liaison with physicians in developing plastic materials and designs to duplicate natural joint functions. Congatulations, Charlie, sounds like a very gratifying and productive endeavor. . . . The June 1967 issue of Engineering and Science carries an article entitled "Digging on the moon" by Ronald F. Scott, I. Dr. Scott, Associate Professor of Civil Engineering at Caltech, specializes in the fields of soil mechanics and foundation engineering. In 1963 he proposed to NASA a soil mechanics experiment to be carried to the moon on a Surveyor spacecraft. His plan came to be in April on a Surveyor III vehicle. . Norton Company, Worcester, Mass., has appointed Maurice L. Torti, II, chief of the armor products unit. This ceramic composite armor is used to protect helicopter personnel and components against small arms fire in Vietnam. Dr. Torti has been director of metallurgical research for National Research Corporation, a Norton subsidiary.

Edmund M. Passmore, III, has received the Purdy award from the American Ceramic Society for making the most valuable contribution to ceramic technical literature during the past two years. The winning paper which Ed co-authored entitled "Strength, Grain Size, Porosity Relations in Alumina," resulted from work done at AVCO Corporation, although he is now at Sylvania Electric in Danvers, Mass. . . . Major Gilbert D. Gardner, IX, was graduated from the U.S. Air Force Command and Staff College at Maxwell A.F.B., Montgomery, Ala. The graduation marked the end of more than nine months of professional military education designed to prepare officers for high command and staff positions. Congratulations Gil (and Jane)! . . . Richard T. Salter, II, is now working at Ingersoll-Rand Company Research Center. Dr. Salter lives in Princeton, N.J., with his wife Polly and two children. . . . John G. Sample, IX, has been named to the freeway operations committee of the National Academy of Sciences' Highway Research Board. John is a transportation systems engineer in the public sectors program office of Raytheon Company's Equipment Division in Waltham. He has been with Raytheon since 1955 and been involved in such diverse areas as microwave, infrared and lasers. The Samples (all four) live at 60 Newcomb Road, Stoneham, Mass. . . . Albert B. Reynolds, VIII and X, is with the General Electric Company as Manager of the SEFOR Physics Unit responsible for the nuclear design of the Southwest Experimental Fast Oxide Reactor currently under construction in Arkansas. . . . Robert P. McDonald, XVII, has been with Vappi and Company, Inc. (contractors) since his graduation from Harvard Business School in 1957. Bob is now a Vice President. Two Class officers have new addresses: Marty Wohl (President) is at 13251 Ponderosa Drive, Los Angeles, Calif. 90049, and Robert A. Ryder (Class Agent) at 20 Hanken Drive, Kentfield, Calif. 94904.-Norman R. Gardner, Secretary, 100 Memorial Drive, Cambridge, Mass.

54

Welcome back. I hope you all had a pleasant summer. I have a stock of accumulated clippings and other raw data for the Review which I'll include over the next few issues. Thanks to those of you who have taken the time to drop a line. In June John E. Preschlack was elected a principal of McKinsey & Company, Inc., a New York management consultant firm. This summer with wife Lynn and two small boys (ages 1 and 3) Jack moved to Germany where he will be based for three years in his firm's Dusseldorf office. . . . David Myers is involved in work on circulatory assist devices for human implantation at Avco Everetts Research Lab. where he is a Senior Design Engineer. He lives in Newton, Mass., with wife Rosalie, Karen 7, and Craig 5. . . . Arthur D. Hughes is with the Professional Services group of the Auerbach Corporation in Philadelphia as Technical Advisor to the Manager of the System Design and Analysis Section. . . . Lewis Salerno is a Staff Assistant at Page Communications Engineers. He and wife Betty are proud parents of Sandra 14, Philip 13, Karen 12, Timothy 12, Buddy 8, Charlene 8, Sean 6, Elaine 6, and David 4. . . Krejci is out in Sunnyvale, Calif., helping to manage Aquanautics Inc., manufacturers of winter airpropelled vehicles. David Weisen reports that he got married last September ('66) but no other

Richard Walker has been promoted to Plant Manager of National Gypsum Company's Bronx plant. . . . James Rude is a mathematician at Sperry Rand's Univac Division and is planning to return to school at the University of Minnesota to work on a Ph.D. in computer science. . . . Benjamin Stevens has been promoted to Professor of Regional Science. . . . Daniel Farkas is finally enjoying the California sun (after months of rain) by

sailing on the bay. Dr. Farkas is at Berkeley. . . . Richard Mapes received an M.B.A. degree from Sacramento State College this summer. Dick, a Senior Engineer at Aerojet General Corporation, reports "2 girls, 7 cats." . . . Frederick Rubel has a new position as Chief Engineer at Infilco/Fuller Company/ General American Transportation Company in Tucson, Ariz. . . . Burton Bernstein is now teaching at State University College, New Paltz, N. Y. . . . Michael O'Neill deserted the bachelor ranks in July and intends to finish his Ph.D. in math during the summer of 1968.

... Harry Taylor dropped a line shortly after the Israeli-Arab conflict reporting that he had survived the shelling of his home and office. Fortunately, the net effect was the killing of one poor dog. Harry is Manager of Propulsion at Israel Aircraft Industries and Senior Lecturer at the Technian (Department of Aeronautical Engineering) for the next two or three years. He writes that he has plenty of room available for visitors, and there are many interesting places to visit there.

Dean Jacoby reported on the following classmates who showed up at Alumni Day at the Institute in June. Pete Peterson was in Boston on business for Goodrich where he is in new product development. Wally Boquist was on the Alumni Day Committee. Wally is with EG&G in Boston. June and Dave Dennen returned to M.I.T. for the first time since graduation. Dave received his Ph.D. last year and has a research group at Lilly in Indianapolis. Dave's father is a member of the Class of 1917 which was celebrating its 50th Reunion in June. The balance of attending classmates are employees of M.I.T., Paul Gray who just received his appointment as full Professor of Electrical Engineering, Bill McTigue who is Executive Secretary of the Educational Council and was on the Alumni Day Committee, and Dean who is Director of the Office of Institutional Studies. Len Gallagher joined the M.I.T. Administrative Staff around the first of the year as Associate Director of the Student Aid Center. He was previously with Arthur D.

Little Company.-E. David Howes, Jr.,

Secretary, Box 66, Carlisle, Mass.

56

Starting off our 12th year on informational notes: President Bob Malster has moved to 11 Winthrop Road in Wellesley, Mass. 02181; Class Agent John Morefield to Pennsfield, Rd 1, Mechanicsburg, Pa. 17055. . . . Continuing the New York Class luncheon program, Walt Frey hosted one on September 21 and is planning another on December 7. For details contact Walt at Pan American World Airways in New York, telephone 973-7525. Attendees in the past year have included attorneys Ed Baker who has his own office at the Chase, Harvey Brownrout who is with Darby & Darby, and Paul Lempel of Kenyon & Kenyon, architect Ron Kiaer of Charles Luckman Associates, management consultant Jean-Paul Dreyfus of Frank C. Brown &

Company, builder Alex Rose of H. L. Lazar and others. . . . Paul Abrahams has joined N.Y.U.'s Courant Institute for Mathematical Sciences as a research scientist to do research in computer programming languages. . . . Kirk Brogden is a mechanical engineer with Stone & Webster, occasionally leaving Boston for projects in Texas and Louisiana. The Brogdens have three children, two girls and a boy. . . . Bing Cady has been promoted to Associate Professor of Engineering Physics at Cornell. He spent the summer at Argonne National Labs. . Terry Carney received his doctorate in mechanical and aerospace engineering last June from Rice and has transferred his NASA assignment from Houston to Cambridge.

Those yellow questionnaires are still coming in. John Cronin writes that he is now a systems analyst with Pfizer in New York after ten years with Shell. The Cronins have three children, two girls and a boy. . . . Merlin Lickhalter has rejoined our Class. Being an architect he was a stray in '57 all these years. Merlin is President of the St. Louis Club this year and a Partner in the Drake Partnership of St. Louis. . . . Scoutmaster Bruce Wedlock attended the Scout Jamboree in Idaho last summer. Bruce B. Bredehoft, 16 Millbrook Road, Westwood, Mass. 02090; T. Guy Spencer, Jr., M.I.T., Room E19-439, Cambridge, Mass. 02139

57

The Reunion at Jug End was a great success. Betty and I are sorry that we were not able to make it. Jack Currie reported the following: "The person who commented that our 10th Reunion was more sedate than the 5th spent his time sunbathing by the pool. Those of us who played volleyball with certain aggressive ex-Class officers, or played in the short 'washed out' softball game, or participated in the midnight limbo contest, know better. Just which event was the most successful is hard to say and best left to individual taste. The President's punchbowl gave us a chance to renew old acquaintances and get to know classmates we hadn't met before. Saturday's poolside cocktail party was made more delightful by a sudden shower which compressed the affair under a ten by six foot kiosk. Whoever thought up that gimmick for breaking the ice showed pure genius. One of the highlights of that evening's banquet was Ed Robert's rendition of the Class questionnaire. Sunday's picnic ended the Reunion and saw some head for Boston and Alumni Day and the rest head home. Our Alumni Day representation was good with the luncheon in the Great Court being a particularly nice place to meet. To those of you who didn't make the Reunion or Alumni Day, you missed a grand occasion and we missed you. We'll expect you next time. It's not so many years away."

The results of the Class questionnaire reported at the Reunion were preliminary, being based on only 238 replies. Ed

Roberts is now compiling the final results including some interesting correlations. These will be mailed to all classmates who have paid their dues of \$5.00. Here is just a sample of the results reported at the Reunion: of the 238 classmates, 59 have obtained doctorate degrees, 17 are still single, five have four or more children, 45 have moved seven or more times since leaving Tech, 3 own airplanes, 22 are looking around for other jobs, 7 spend over 75 hours a week at work, 57 watch TV less than two hours per week, 84 voted for Goldwater, 139 voted for Republican governors, 11 have gained more than 25 pounds in weight, 13 propose bombing China, and finally, most find work gives them the greatest satisfaction. . The following were elected Class officers for the next five years: President-Mal Jones, Vice President - Hugo Liepmann, Treasurer - Jim Cunningham. Recording Secretary - Marty Forsberg, Class Agents - Ed Roberts, Harry Duane, and Jack Safirstein. I am very happy to be continuing as Class notes Secretary. That's about all for now. Next month the column will return to reporting on activities of various classmates. I have some interesting news concerning Harry Duane and Jay Bonnar, in particular. If any of you composed poems or lyrics in commemoration of the 10th Reunion or have any reminiscenses, please send them. Other news and gossip is also welcomed, naturally .-- Frederick L. Morefield, Secretary, 18 Whaddon House, William Mews, London S.W. 1, England

58

Hello again and welcome to that growing group who doesn't believe next June is our 10th Reunion. But it's true, it's true! The weekend of June 7, 8 and 9 is the date to mark on your calendar. The place is Stratton Mountain in Southern Vermont just north of Brattleboro. This beautiful resort area offers a challenging, custom designed golf course, swimming pool, tennis courts, hiking on the Appalachian trail, fishing and many other activities. This will be a full weekend of enjoyment and relaxation and an opportunity to renew old friendships as well as make new ones. If the mailings are not reaching you, please write me and include your address so we can send you all the details. Class dues of \$3 are due; make your check payable and send to: Warren Heimbach, Treasurer, 2809 Palos Verdes Drive West, Palos Verdes Estates, Calif. Your committee for the Reunion will also appreciate your suggestions to make the Reunion enjoyable for you. Some of you have already responded with good ideas. So mark your calendar, send your dues, and plan on a wonderful reunion weekend!

And now to our mailbag and news.

Robert Jones is now a senior engineer at United Aircraft Corporate Systems
Center in Hartford. Bob joined UAC after receiving his S.M. at M.I.T. in XVI. Married to a graduate of Simmons College, the former Maryanne Powell, Bob writes that they now have another member

of the family, a son, Lawrence, one year old. He also reports that "some other classmates are working here also. Donald Isakson is a supervisor of inertial systems testing, Al Schoen just moved from here to Princeton, N. J., last year, and Larry Boedeker has just moved here to join the research laboratory." Philip Strong, wife Darragh, and children Kelly 7 and Tracy 8 are living in Philadelphia where Phil is a project engineer with the Budd Company. . . . In Washington, D.C., Migdon Segal is working for the Library of Congress, Legislative Reference Service. . . . Joel Klein is a chemist with the U.S. Army Edgewood Arsenal in Maryland. He and Annette have two children, Avraham 7 and Rivka 3, and are living in Baltimore. Ann and Robert derHagopian are now living in the countryside in Wrentham, Mass., south of Boston. . . . Alan Hurkamp works at Raytheon where he is a senior engineer. He and Rosemary have one boy, Mark, age 7.

Arnold Jacobsen has been solving some difficult production problems and received some notice in the trade press. As Production Supervisor at the Goddess Bra Corporation in Boston, he has improved production and reduced losses substantially through production management techniques. (We always knew M.I.T. provided a good foundation). . . . Edward Goldman is co-author of "How to use Fluorocarbon Plastics as Bonding Agents" in Adhesives Age. . . . Claudia and Ernest Flemig are in Huntsville, Ala., where he is a Task Team Manager for Thiokol Chemical Corporation. Their family consists of two boys, Steven 7 and David 4. Flying is his major hobby. Sam Oolie is Executive Vice President of Drinx Plus, an automatic food service company. He also serves on the Board of Governors of the New Jersey Association of the NAMA. Family hobbies include horseback riding for Sam and Marjorie, but Janis Lisbeth, their daughter, is only two and has to wait a while before becoming an equestrienne. Lewis Bastian is a programmer at IBM in San Jose. He and Donna have three girls, Laura 10, Barbara 7 and Karen 3. . . . Richard Murdock is in Houston as a group leader for Diamond Alkali Company in the plastics R&D group. His wife Nancy keeps busy with William 4 and Kristin 21/2.... Paul Kossler is an engineer at IBM Owego, N.Y., working on the development of strategic aircraft avionics systems. Paul and Ruth have a girl Cynthia, four. . William Hansalik writes, "am an assistant professor at the University of Syracuse. Working on pattern recognition and computer learning but the kids still learn better than my theories. Heidi and I have two children now, Roland 3 and Derek 1. Received my Ph.D. at the University of Southern California in 1965 and have written a few papers in spare time."

We were saddened to receive a letter from Lee Bricker telling us of the death of a classmate. "Aviva Rubin Tepley, wife of Norman Tepley, VIII '57, passed on in June in Detroit. She married in 1959 and moved to Detroit with Norman when he joined the Physics Department at Wayne University in 1963. Their first child, Jamina, was born in January 1967. Shortly afterwards Aviva began her battle against cancer. It was a battle she waged with full knowledge of her foe and with stunning courage, against what proved to be hopeless odds." . . . It is also with sorrow that we report the death of Tuure Wirkki in May. While working on his car, another car ran into his, knocking it off the blocks and onto him. At that time Tuure had been in the R&D Department of Veeder-Root in Hartford, Conn. Prior to this he worked at Skinner Precision in New Britain and Hamilton Standard. He leaves his wife Nancy and three children, a son Rolf and two daughters Karin and Inga. These tragic deaths take from us two classmates who will be greatly missed. Our sympathy is with the families and the children as they go forward with this great loss. Michael E. Brose, Secretary, 1171 North Street, Walpole, Mass.; Antonia D. Schuman, Western Associate, 22400 Napa Street, Canoga Park, Calif.

59

Welcome to a new year of notes, the ninth for our class. I find it hard to believe that it's been that long, particularly with having been around the Institute for the past four years. Even those student days are over now, though, and its the workaday world again for yours truly. The same is true for at least two other classmates who last summer joined the ever-growing ranks from '59 with advanced degrees: Robert Flagg received his Ph.D. from the University of Toronto's Institute for Aerospace Sciences and has joined the academic staff there; Robert Voight earned his M.S. in civil engineering from Kansas University. It might be interesting to get a degree breakdown on the class; if I get sufficiently gung-ho and can find the time, maybe I'll get a questionnaire out this year. On the other hand, of course, there are only two more years until the next reunion. There is such a terrific quantity of news this month that I hardly know where to start. Things have piled up to such an extent over the summer that the Review has asked the Class Secretaries to hold articles so that a complete crush can be avoided in this issue. I had dinner with Dick Sampson and Chuck Staples at the beginning of the summer; they are both management consultants but with "rival" companies in the Boston area. . . . Don Spiller stopped through town with Cindy on their way up to visit her parents in Maine; he's with IBM in Texas, primarily handling the LTV data processing account. . . . Emile Battat is Supervisor of Diversification Planning for Kaiser Aluminum and Chemical Corporation; he was married in April 1964 (doesn't say to whom) and has a daughter, Lisa, two vears old.... John Covington is now Managing Editor of the New York magazine Cycle; he has his M.A. in English from Columbia.

Dave Packer has been named Data Proc-



When the U.S. Senate this summer rejected proposals for two dams on the Colorado River near the Grand Canyon National Park, three M.I.T. alumni could take special pride in their roles in the lengthy debate. Alan P. Carlin, Ph.D. '64, and Laurence I. Moss, '56, both of Rand Corporation, working with Jeftrey Ingram, '58, Southwest Conservation Representative for the Sierra Club, developed and presented to the Congress economic and engineering data on alternate power generation and water supply systems. David R. Brower, Executive Director of the Sierra Club, the California mountaineering organization which led the fight for conservation of the natural features of the Grand Canyon, believes that these studies were so important that the nation may literally owe the Canyon's preservation to the work.

essing Manager of Digital Equipment Corporation; this is a "second hat" for Dave who also serves as Manager of Systems and Procedures. He has had a book published by the M.I.T. Press, Resource Aquisition in Corporate Growth. James Brown is now with Control Data in Palo Alto designing remote computing systems for the 6600 computer; he's had recent visits from Paul McKeown down from Seattle and Al Bardwick and his family out from Birmingham, Ala. . . . James Cantrill is Manager of Advanced Development, Polycarbonate R&D of the Chemical Materials Department of G.E.; he scores high with five daughters and one son.

David Moffett is presently working towards a Ph.D. in particle physics at the University of Rochester while his wife Jane lectures at the University's Memorial Art Gallery; they have a two-yearold son, Jeffrey. . . . Joe Mogilner is President of International Yacht Corporation, builders of fiberglass trimaran sailboats. . . . Steve Samuels picked up his Ph.D. in statistics from Stanford back in 1963 and served as an Assistant Professor of Math and Statistics at Purdue from then until last year when he was awarded a two-year Visiting Professorship at the University of California; married last March, his wife Myra is a graduate student in the Statistics Department at Berkeley. Steve will be promoted to Associate Professor upon his return to Purdue next year. . . . Dwight Crane has been promoted to Director of Operations Research, Mellon National Bank and Trust Company in Pittsburgh; there's been a new addition to his family, Catherine Wilson, born last March. To keep the editors happy, I'll sign off for now. Let's keep a good two-way conversation going this year, OK?—Glenn Zeiders, Secretary, 3 Rose Ave., Watertown, Mass. 02172

60

Norm Vadner sends no photo, "only elaborate details of my life and times. I received an M.B.A. from Columbia this year and since have moved to Rochester (N.Y.) where I'm working for Eastman Kodak as a cost engineer. I enjoy the work very much. I've been married for two years to the former Maureen Erb, 60. Penn State. Maureen will substitute teach in the public schools of Greece, N.Y. I've seen Dave Stanley, Bob Smallman (who has 4 children) and talked over the phone to Blake Foster. We'll be getting together at the M.I.T. Club of Rochester's annual meeting and steak roast later this month." Sounds like a good party; hope lots of '60's show up for that meeting. . . . I was at the M.I.T. Faculty Club Friday night (September 8) and thought for a while I was seeing ghosts; as it turned out, I was. Larry Martin was married that afternoon, and his reception was in full swing, with Charlie Rook and Ralph Cuomo among the quests. Charlie works with Larry at Lincoln Labs. Sorry I didn't get the bride's name, but perhaps that will appear in my mail in the next few weeks or so.

From Steve Gill: "It seems an age since graduation, but I remember those Course VIII exams as though they were yesterday. I am still at Stanford Research Institute (since 1964) as head of the High Energy Gasdynamics Group. We have been generating high velocity shocks in gases (3 to 60 km/sec) using explosives as the energy source. We have been getting temperatures up to 60,000 K and electron densities in excess of 10° electrons/cc-an M.I.T. version of hot air. Both the physical and intellectual climates are stimulating at Stanford and the San Francisco Bay Area (with or without LSD). I've been engaged in a variety of minor extracurricular activities, including teaching a graduate seminar course at Stanford in acoustics and traveling to Freiburg, Germany, to present a paper at a shock tube symposium. I haven't heard too much from the Class of 1960 recently, except that Bill Kleinbecker (VI) just adopted a baby boy. I was sorry to have missed the 5th Reunion two years ago-maybe I can make the 10th. I am presently settled in Atherton, Calif., in a large house surrounded with flourishing camellia plants. It's always open house at the Gill house for the class of '60." Thanks for the letter and the invitation, Steve. I have more news but will hold it for next

month just to keep everyone's attention. Besides, I'm late typing these up and have just run out of time. Send your life and times to —Linda G. Sprague, 345 Brookline Street, Cambridge, Mass. 02139

61

After the fly-boys finish breaking their necks trying to beat the Russians, the serious business begins. Among the scientist-astronauts being included in future missions to the moon will be Bill Lenoir. Soon after the announcement last July, Bill took off for Houston. Back in June Bill, Jerry Grossman, Dave Ness, Pete Gray and Bill Jarmain along with their wives (read dates, where it applies) converged, from around the country, at Expo 67. Due to good old computer controlled LOGEXPO they arrived to find that their motel had not vet been built. Thus thwarted the machine spewed out the name of another place which turned out to be a quonset hut. As the mob drove up, the lights went out. Hysterical with laughter they all climbed into one bed. A photograph of the occasion was taken and will be presented here when and if available. More Ph.D.'s Bill Nieckarz got his in chemistry at Carnegie Tech. along with Ronald Sundelin (his in physics). Farther West, at Case, Paul Yaffe got one in metallurgy. And all the way West, in Pasadena, Prexy Lee Dubridge (Cal. Tech.) handed out the sheepskins (or whatever they use out there in injun country) to Donald Hartill (physics) and Richard Naylor (geology). . . Mike Pearlman reached the North Pole on an expedition last May (the 5th of May). . . . Dorsey Dunn works for Mobil. He is in the Agricultural Chemicals Division and the Manager of Market Research. . . . Martin Flaxa writes: "After finishing my Ph.D. in polymer chemistry at Brooklyn Poly., I joined the staff of the Laboratory of Chemical Pathology at the Harvard Medical School where I am establishing a chemical research program on the structure and function of proteins and nucleic acids of human cells. These studies explore the fundamental mechanisms of cell growth and division which are the central problems of cancer research and tissue transplantation. I was married in August 1965 to Madelon Maremont. Madelon teaches modern dance to children." Martin also reported that Dr. Ken Lembach is studying viruses at M.I.T. and the Dr. Hugh Willis is a group leader with TRW in California.

Richard Chang: "We just had a new addition to our family, a girl. Our son, the eldest of three, will be starting kindergarten this fall." ... Glen Stoops wrote that he "will receive his Ph.D. in math from Rice University in early June (last June that is) and go to work for Litton Scientific Support Laboratory, Fort Ord, Calif., late in June. One wife, no kids, one cat." ... Last March 27 John Kogan had a first child: Suzanne Lynn Kogan. ... Seigo Matsuda, "In April I was appointed to Advanced Tech-

nologist which is the second highest rank in the Monsanto Company's advancement program for scientists and technologists. I am still at Monsanto Research Company, a subsidiary of Monsanto, working on fuel cell development. . . . John Wolf got a Ph.D. in organic chemistry in 1966 and that was enough to get him into DuPont, Wilmington, where he is (you guessed it) a chemist. . . . John Vicek is a consultant on information systems for Bonner and Moore Associates. That sort of work gave him trips to the Middle East. His wife, Alice (Simmons '64), produced a number one son, Eric John, last December 21. ... I got a nice letter from Bob Ried last June. He said the six years of secrecy was enough and went on: "My wife, Mary Ellen, and I have two children. Robert Paul 4 and Sonia Louise 3. I've been working for the NASA Manned Spacecraft Center since graduation. We are living in the quaint little town of Friendswood, which borders on the rural side of suburbia. I'm happy to say that I've just received my Ph.D. in mechanical engineering from Rice University and plan to continue working on radiation transfer for NASA." Thanks, Bob. Perhaps you'll cross paths with Astronaut Lenoir.

Noise Filter Department: This will probably be a regular feature of the column. It is a series of correction of errors in previous columns. Here is a letter I received last May. "I read with amusement the Class notes of the May issue of Tech. Review. I happen to be Donald Graham Morrison and it is I who went to Stanford and have a wife Sherie and a daughter Heather. Whenever I send anything to M.I.T., I always use my full three names as there is also a Donald George Morrison in our Class. Now when I saw that my name had been truncated in the class notes, I went to my Technique and found that indeed our class also has a Donald Graham. At this point I almost gave up the Class notes as a means of communicating information about myself. At the moment my life seems plagued by namesakes. I have been doing some research in multivariate statistics. A few months ago a new book in that area was published. The author is a Donald F. Morrison. By some twist of fate, he did not go to M.I.T. My list of confusions with Donald George Morrison."-Andrew Braun, 131 Freeman Street, Brookline, Mass. 02146



William Ames received his M.S. in physics at Caltech this June. . . . Leonard Buckle has completed his duty with the Army, spent this summer in Europe, and has returned to the Boston area. . . . Ernest Cohen received his M.S. in instrumentation engineering at Case Institute of Technology this June. . . . Robert Cummings has joined the business administration staff at the University of Connecticut as a research specialist. Since leaving M.I.T. he has received his M.S. at Harvard Business School and



Army First Lieutenant William J. Schild, S.M. '64, (right), receives congratulations and a Certificate of Achievement from Colonel Harry Bush, the commanding officer of the Army Aviation Materiel Laboratories at Ft. Eustis, Va., March 22.

worked for Boeing. . . . Norman Davis was married to Sandra Lee Hall in Syracuse, N.Y., this June 24. . . . John Drumheller has established his own systems analysis and programming firm in Seattle which is called Ikon, Inc. . . . B. Richard Fow, M.S., has been named to the research staff in the Atmospheric Physics Department at the Sperry Rand Corporation plant in Sudbury, Mass. . . . James Giffin received his M.B.A. with honors this June at Harvard Business School. putting him in the top 10%.... Tapan Gupta, Sc.D., has joined the Science and Technology Group at the Westinghouse Research Labs in Pittsburgh. . . . Robert Howie was married to Miss Susan Shepard of Wilton, Maine, in March of 1966. Susan is corporate secretary to Dynatech Corporation, and Robert is at the M.I.T. Instrumentation Lab working on various projects concerned with inertial navigation and space-borne computer design. . . . Ronald Rise, M.S., is working on his Ph.D. in transportation engineering at the University of Toronto where he is also a lecturer. . . . William Schild, M.S., received a Certificate of Achievement from the commanding officer of the Army Aviation Material Labs in Ft. Eustis, Va., for outstanding service as a chemical engineer during his tour of duty. He has been an officer in the Army since March of 1965. . . . Arnold Siemens is working on his Ph.D. in physics at M.I.T. . . . James Tillotson was apparently our Class' only member attending Alumni Day this June.

Francis Tuggle received his M.S. in industrial administration from Carnegie Tech this June. . . . Jon Valbert, Sc.D., married Miss Jane Farrell of Hopkinton. Mass., on May 20 of this year. He is now teaching at M.I.T. . . . John VanSaun received his M.S. in metallurgy at Carnegie Tech this June Walter Winshall is the first member of our Class I know of who has been written up in Time. In the June 23 issue the world was let in on Walter's little secret: that for the past two years he has been a full time student at both the Sloan School of Management and at Harvard Law School. He received his M.S. at M.I.T. this June, but Harvard was so annoyed

at having the sheepskin pulled over its eyes that it refused to give him his law degree "pending an investigation." Whatever the outcome, Walter is now working on his Ph.D. at M.I.T., running his own data processing company, and working in the research department of the brokerage house of Oppenheimer & Company. ... David Wolfson has been graduated from the training course for Air Force weapons controllers. He has been assigned to Gunter AFB, Ala., for duty with the Air Defense Command. . . . That is the news for now. Please write, sending along all news of classmates or yourself. Any contribution of information will be gratefully acknowledged and published in this column. I might add, by the way, that I have returned to my home in Memphis after graduating cum laude from Harvard Law School this June. (Unlike Walter, Harvard Law was all I could handle!) I am now an associate with the firm of Farris, Hancock & Mitchell in Memphis -Ron Gilman, Secretary, 1021 Oakmont Place Apt. 8, Memphis, Tenn. 38107

65

Yours truly has finally left the hallowed halls of ivy and is now working for Booz, Allen & Hamilton in their Cleveland office. This makes gathering the Class news once a month much more difficult and makes it essential that you drop me a note once and a while if these notes are to come out on a regular basis. So let me hear from you!! This month's news is mostly graduations and weddings. Alan Leslie, Dennis Slevin, and Geoffrey Gill have received their masters in industrial administration from Carnegie. Dennis is going on for his Ph.D. at Stanford. . Jeff Karas has received his M.A. in mathematics from U.C.L.A. and has accepted a staff doctoral fellowship from Hughes Aircraft for further study at U.C.L.A. . . . Bob Menzies has received his M.S. in physics from Cal Tech. . . Richard Morgen received his masters in engineering from the Case Institute of Technology. . . . Howie Ellis and Eric Morrow received their M.B.A.'s with Distinction from the Harvard Business School. Howie is going on for his Ph.D. and spent the summer working on a research project for Booz, Allen & Hamilton. Eric will be working for Burlington Industries in New York City. . . . Of the other recent Harvard M.B.A. graduates, Phil Smith is going to work for Grumman Aircraft in Long Island, Fran Mechura is in New York City working for Continental Can, Mike Huke is an administrative and financial officer at General Testing Labs in Washington, D.C., Pete Kornafel is in the product planning department of Ford's truck division in Dearborn (Pete and the former Miss Lorraine Lindsey of Denver were married in June), Cary Shaw is a 2nd Lt. in the Army, Doug Spreng is with Hewlett-Packard in Palo Alto, Calif., and Perry Seal is working with IBM in Chicago.

Dick Arold is now working for W. R. Grace in Washington, D.C. after finishing his masters at M.I.T. in Chemical Engineering. . . . **Pat McCloskey** is working

for Merck while studying for masters at Stevens. . . . Tom Van Vleck is working at Project MAC and will probably return to M.I.T.'s grad school of electrical engineering. . . . After working on logic design for Raytheon Peter Bird entered the Air Force flight training program. . Bob Szpila is currently analyzing ballistic guidance systems for the Autonetics Division of North American Aviation. . Peter Bohmer is returning to M.I.T. to do doctorate work in economics after spending a year at Northwestern's graduate school. . . . Charles Albers is at the Univversity of South Carolina on a NASA traineeship. . . . Matt Mleziva is at the Vandenberg Air Force Base in California fulfilling his NROTC commitment. Rick Gander has finished up his M.B.A. work at Wharton. . . . Marshall Slemrod is at Brown working towards his Ph.D. in applied math. . . . After getting his masters in electrical engineering Bruce Golden is now a student at the Harvard Law School where Bill Samuels is entering his final year. Bill spent the summer working on Wall Street for Lehmann Bros. . . . Karl Frederick is a 2nd Lt. in the Air Force and has just completed the training course for ballistic missile early warning systems surveillance officers. George Thurman is currently assigned as assistant operations officer in the 588th Engineer Battalion and is stationed in Vietnam.

George McKinney has been working for Corning Glass works for the past two years and is now at Stanford working towards his doctorate in business administration. His wife, the former Marie Maynard, Simmons '66, is expecting their first child the middle of September. Michael Marino has been named an author for the 1967 Spring Joint Computer Conference. . . . John Hafstrom received the Goodwin Medal awarded by M.I.T. for conspicuously effective teaching. John has been a teaching assistant in metallurgy and is working towards his Ph.D. in the physics of metals. . . . Another teaching award went to Ed Moxon for effective teaching in the M.I.T. Electrical Engineering Department. . . . Chuck Hurd has finished his Naval tour of duty and will be entering law school at the University of Colorado. . . . Dave Dewan is going to Harvard Business School this fall as well as continuing to expand his very successful computer dating service. . . . Jim Larsen and the former Miss Marie Dresser were married in June. Among the ushers was Marshall Fisher who will be continuing at the Sloan School this year. . . . Jon Hanson was married in August of 1965 and is currently working for the Hooker Chemical Corporation in Washington D.C. . Dennis Nyberg and the former Miss Nancy Dell were married last May and are currently living in Gifford, III. . Roy Harris and the former Miss Sarah Lee Thorpe were married in the M.I.T. chapel this June. Serving as best man was Charlie Seitz. Both Roy and Charlie (who has been recently promoted to Instructor) will be continuing their graduate work in electrical engineering at M. I. T. Finally Dick Schmalensee and myself exchanged best man honors at

our weddings at the end of this summer. Dick married the former Miss Diane Hawk of Chagrin Falls, Ohio, and Wellesley College. Dick will be an Instructor at M.I.T. this year and will continue to work on his doctorate in economics. Jan and I were married in Trinity Church, Boston, on September 2. Serving as ushers were Mike Huke and Mike Keehner and also present were Bruce Mc-Gregor, Mike Gilford, Roy Wyttenbach, Marshall Fisher, and Dick Tsien (who has returned to England to finish up the second year of his Rhodes Scholarship). That's it from the Cleveland outpost for this month. Let me hear from you soon. Jim Wolf, 24455 Lakeshore Blvd., Apt. 1114, Euclid, Ohio 44123

66

It is with a great amount of regret and sorrow that I announce the death of Gerald Wolpin this past February. Gerry was enrolled at the University of California at Berkeley when he met an untimely death from a fall from a campus dormitory. Attending U.C. on a National Science Foundation Fellowship, Gerry had already received a coveted Churchill Fellowship for study this fall at Cambridge University. I had many personal contacts with Gerry during his years at M.I.T. and I am sure all of you join me in expressing our deepest sympathy to his family. Gerry was a true gentlemen in every sense of the word: I first met him on a squash court, and there is one place where gentlemen can be found and appreciated. This fine young man was a Dean's List student his entire career at Tech, and it is with great sadness that we must recount his shortened life. . . . Several members of the Class have won some awards recently, and to them a tip of the '66 hat. . Robert Wells won a student honorable mention in U.S. Steel's Bridge Design

... Robert Wells won a student honorable mention in U.S. Steel's Bridge Design Competition worth \$500.... For his paper entitled "Solar Observations at Millimeter Wavelengths" NEREM awarded a \$100 prize to Woodruff Turner Sullivan 3d, now enrolled in the Department of Astronomy at the University of Maryland.

An extra special tip of the hat is due to all those now serving their country through the Peace Corps and the Armed Forces. At a time when patriotism is often in short supply so it seems, I find it gratifying to find so many of our classmates choosing such endeavors. Tom Scott has put his civil engineering skills to work in Venezuela with a Peace Corps project assisting municipal governments. Also in Venezuela, Steve Woolf. . Others in South America are Richard Cuttler in Peru and Dick Leonard, who is working as a city planner in Chile. Others around the world include Ray Pfau, Dave Cressy, and Roger Rasmussen. Serving around the world in the U.S. Military: 2nd Lt. Walter Wallace is assigned to the Division of Civil Engineering, Clark AFB Philippines. . . . Ens. George Leslie is with the submarine service. . . . 2nd Lt. Larry King is serving as an Aero Engineer at Wright-Patterson AFB, Ohio.... 2nd Lt. Duncan Rhodes is completing tank training at Ft. Knox, Ky.... 2nd Lt. Craig Schiele is undergoing pilot training at Vance AFB, Okla... 2nd Lt. Tom Gomersal in undergoing training in missile launch operations at Chanute AFB, Ill.... Ens. Raymond Petit reports a great deal of enthusiasm for his work as a ship superintendent at the Pearl Harbor Naval Shipyard.... Others completing training and now on assignment include 2nd Lt. Tom Hutzelman and Ens. William Dehart.

On the scholastic scene, receiving M.S. degrees in E.E. from Carnegie Institute of Technology this past June were Waitak Peter Lee and John Louis Lehr. At Cal Tech June M.S. degrees went to Lee Casperson, Thomas Grover, and David Vahey. . . . Jim Butler is a Ph.D. candidate in chemical physics at the University of Chicago. . . . Elliot Lehman is working in a graduate physics program at Stanford. . . . Leonard Levin is in a Ph.D. program in oceanography at the University of Washington. . . . At Purdue in chemical engineering Ben Gikis. . . . Working toward degrees in E.E. and Math at M.I.T., Marty Kaliski. At the University of Wisconsin in a Ph.D. program in physics is Bob Frommer. . . . Carl Jones is at M.I.T. in civil engineering and was supposed to go to the Netherlands this summer for some special research in hydrodynamics. . . . A large group at the Harvard Business School includes National Fellowship winner Dave Anderson and Monte Graham who reports that "the work is hard, and the weather no better on this side of Central Square."... Arlee Reno is studying in city planning at M.I.T. At Yale in biochemistry, Susan Tourtellotte. . . . And now to news from the medical school crowd. . . Dan Dedrick is the lone Tech man in 2nd year class at Yale. . . . At Physicians and Surgeons of Columbia University, John Hoche, Tom Rice, and Paul Gustavson. . . . At Harvard Medical School, Chuck Davis, Ken Ault, Ira Davidoff, and Jim Veazey. Ira and Jim roomed together this past year. . . . At the University of California Medical School in San Franicsco is Jerrold Abraham who spent this past summer at Woods Hole, Mass., after his marriage to Harriet Sostman of the Museum School of Art in Boston. . . . Dan Camerini-Otero is in an M.D.-Ph.D. program at N.Y.U.... Joel Karlinsky heads to Tufts Medical School this year after spending this past year at M.I.T. . . . In the 2nd year class at Tufts, Joe Adolph. . . . At the University of North Carolina School of Medicine, Gane Sher-

Karen Shields worked this past year as a mechanical engineer for the Navy's Research and Development Center in Annapolis. This year she and her husband Tom return to Boston for graduate training at Harvard, he at the Business School and she in secondary education. . . Steve Weiss reports that he and his wife Stefani are both in Ph.D. programs at the University of Michigan; he is studying in communication sciences and

she is in the Department of Zoology. . . . Paul Rudovsky communicates that all is well at Carnegie Tech including his being pinned to Miss Shirley Mazur of Mt. Mercy College, New York. . . . On the marrying scene, Mona Dickson and Thomas Jensen, '67, were married on June 17. . . . Mike Marx and the former Miss Sue Super of Boston U. and Riverdale, N.Y., were married in June. Mike is presently employed by TRW Systems in Southern California. . . . Steven Disman was married to the former Miss Donna Backer of Boston U. in June of 1966. Steven is working toward a master's in Civil Engineering at M.I.T... Hans Borler was married to the former Miss Dianne Arbuckle of Ohio State University in June 1966. Hans is enrolled in a Ph.D. program in physics at Stony Brook. Dave Lampert and the former Miss Lynne Leiberman of Boston University and New York City were married July 3. 1967.... John Hoche and the former Miss Muffie Ison of Wellesley College were married in August 1966. . . . Bo Pasternack and the former Miss Roberta Levine of Boston University and New Rochelle, N.Y., were married on August 26, 1967. Bo is now at Stanford in a Ph.D. program in aero after completing his M.S. at M.I.T. this past year.

Kenrick Lentz is now with the M.I.T. Instrumentation Lab as a staff engineer after spending a year with Pratt & Whitney Aircraft. . . . Mark Yogman spent this past summer with Esso and has returned to complete his second year at the Harvard Business School. . . . Sanford Libman is a systems analyst with Bolt, Beranek, and Newman, Inc. . . . Jon Wexler is working for the Research and Development Division of Hughes Aircraft in Culver City, Calif. . . . Michael Gentry is working for Texas Instruments in Dallas on the Mariner Mars '69 Project. ... Tim Connelly is working on research in space propulsion for the Lawrence Radiation Labs in Livermore, Calif. . I received a very interesting letter from Charles Tsiang who is working for the Smithsonian Astrophysical Observatory. He is now at a tracking station in southern Argentina operating a precision timing system in addition to responsibilities on the Magnetosphere Project which is attempting to relate electromagnetic ducting produced by magnetic field line with solar activity. . . . Judy Risinger Perrolle reports that her first year of teaching high school students proved challenging, since 10th grade girls "ask some questions that 8.01 and 8.02 never answered." . . . I do hope that I will be hearing from more of you in the weeks and months to come. Recently I have attempted to start a series of communications which will bring more of you in contact with each other as well as relaying some news to me in the process. In any event, please take a moment from time to time to send me some news concerning yourself and any of our classmates whom you may have seen. Another quick reminder, don't forget the Alumni Fund. You can begin a good habit by contributing every year to M.I.T. The strength of private institutions like M.I.T. depend

on those of us who benefited so much from it—Gene Sherman, 74 Willow Terrace Apts., Chapel Hill, N. C. 27514

67

Your Secretary has received about 300 post cards from his classmates. However, almost all the cards contain only a minimum amount of information; as a result, individual news items will be appropriately short. Due to the number of cards received the news will be divided into a few articles. Steve Alter has a University Fellowship at the University of Chicago. . . . Enrico Ancona is doing graduate study in electrical engineering at M.I.T. as a research assistant for Project MAC. . . . Larry Aronberg has a research assistantship at Georgia Tech. . . . Benjamin Ashton has an electrical engineering teaching assistantship at M.I.T. . . . Bruce Barron is now working for Douglas Aircraft Company as an associate engineer. . . . Warren Belfer was married in November of 1964 and now has an eight-month old son. Warren is in graduate school at M.I.T. . Don Bellenger is at the Harvard Business School. . . . Judson Benjamin is now in graduate school at Brandeis University. . . . Doug Benson is attending the Sloan School of Management, Doug has been married since the fall of 1966. . Samuel Bergman is in the Master of Arts in Teaching Program in Physics at Wesleyan University. He has a U.S. Office of Education Urban Teaching Program Fellowship. . . . Don Berliner is in graduate school at the University of Pennsylvania. . . . Victor Bermudez was recently married to the former Sharen Adams of Simmons College and is now teaching assistant at Princeton University. . . . Dave Berrian is a research assistant in the Department of

Jack Bodner is in graduate school at Stanford. . . . Bob Bosler is attending the Harvard Business School. . . . Richard Breinlinger is an engineer with Bell Aerosystems. . . . Ken Bright has a teaching assistantship at Brandeis University. Miss Ellen Bronstein did research for Du Pont after graduation and is now studying physics at the University of Pennsylvania. . . . Ronald Brown has a NSF Traineeship at the University of Chicago. . . . William Brown has a research assistantship at M.I.T. and plans next year to enter graduate school in metallurgy. . . . Tom Brownscombe is studying at Rice University after having worked for Texas Instruments during the summer. . . . Richard Bryan has a NSF Fellowship at M.I.T. . . . Lawrence Burgess also is in graduate school at M.I.T. ... Paul Caragine is studying chemical engineering at M.I.T. . . . Yupo Chan is a research assistant in Civil Engineering at M.I.T. . . . Dave Chapman was married June 24 and is now in graduate school at M.I.T. . . . John Child will study at Oxford University for a bachelor of philosophy in politics. . . . Bill Christiansen is attending the Sloan School

Geophysics at M.I.T. . . . Bill Bloom-

at the University of Rochester.

quist is a teaching assistant in optics

of Management. . . . Terry Collins worked for Bendix Corporation during the summer and is now in graduate school at the University of Wisconsin. . . . Pat Confalone received the Harvard Graduate Society Prize, a full fellowship, and is studying for his Ph.D. in Chemistry.

NSF Fellowship winner Ross Corotis is at M.I.T.... Daniel Corwin is a house tutor for Sigma Alpha Epsilon and is in graduate school in mechanical engineering.... NSF Fellow Mike Crane is at M.I.T. Mike plans to be married in De-

cember. . . . Ed Crosby is working in the Ordnance Department of General Electric in Pittsfield, Mass. . . . Brad Cross is with the NASA Electronics Research Center. . . . Nathan Curland is continuing in electrical engineering at M.I.T. Robert Curtis was married in September and has an M.I.T. teaching assistantship. . . . Bob Damon has a teaching assistantship at the University of Vermont. . . . Donald Davis is working for the Columbus branch of North American Aviation. . . . Joe Deichman is with Bell Aerosystems. . . . Harvey Deitel is at

M.I.T. as a research assistant with Project MAC. Harvey was married in September to the former Barabara Sue Zigman of Westburg, N.Y... Barbara Desmond is married to Byron Gilchrest, M.I.T. Class of '66. She is now attending the Harvard Medical School... Dave Dilling has a position with Douglas United Nuclear, Inc., in Richland, Wash. Dave also plans to attend graduate school part-time at the University of Washington.—Jim Swanson, Crothers Hall, Room 240, Stanford Law School, Stanford, Calif. 94305

Course Review

V

The following were awarded the doctorate in chemistry at the graduation exercises on June 9: Arthur M. Malenfant (analytical), B.S. 1963, from the University of Rhode Island: Richard Cartwright (physical-organic), B.S. 1963, from Carnegie Institute of Technology, S.M. M.I.T., 1966; Mrs. Judith A. Harbison (physicalorganic), B.S. 1963, from the University of California at Davis; Theodore F. Jula (inorganic), B.S. 1963, from Geneva College, Pennsylvania; Ralph A. Zimmerman, B.S. 1964, from M.I.T.; and **Chin Hsien Wang** (physical), B.S. 1964, from Utah State University. . . . David R. Blank (organic), B.S. 1964, from Oakland University, Rochester, Mich., was awarded the S.M. degree. . . . Of the six awarded the doctorate, four have accepted positions in industry, two have accepted temporary postdoctoral appointments at M.I.T. David Blank has a position in industry. . . . Of the 40 awarded the S.B. degree in chemistry, 1966-67, representing the largest senior class in this field on record, 39 have been admitted to the graduate schools of their choice as candidates for the doctorate -four to Wisconsin, three to Harvard, three to Princeton, two to the University of California at Los Angeles, two to the University of California at Berkeley, two to Purdue, two to the University of Vermont, two to Stanford, and one each to Yale, Harvard School of Public Health, University of Pennsylvania, Rice University, Buffalo. Iowa State, Rensselaer, California Institute of Technology, University of Rhode Island, University of Chicago Medical School, Boston College, Oregon State, University of Chicago, Brandeis, University of California at Santa Barbara, University of Maine Indiana University and M.I.T. in chemical engineering. Our graduates were advised to apply for and to accept teaching assistantships, in place of fellowships, as a means of acquiring a broader education and a closer relationship with other students and with the academic staff.

Robert Cargill, Ph.D. 1960, joined the staff of the University of South Carolina, Columbia, S. C., in 1962 and an announcement has been received of his promotion to the rank of Associate Professor. Bob enrolled in the graduate school as a candidate for the doctorate in organic chemistry in 1955 with a B. A. degree from Rice Institute, was awarded the doctorate in 1960 and accepted a National Institutes of Health Postdoctoral Fellowship to study with Dr. Dauben at the University of California at Berkeley. In 1957-58 he held the Forris Jewett Moore Memorial Fellowship. He had many exceptional offers from industry but preferred to teach, "somewhere where it is warm the year round."... Announcement has also been received of the election of Kenneth B. Wiberg, Professor of Chemistry at Yale University, to the National Academy of Sciences. He was awarded the S. B. degree in chemistry, February 1948, and his doctorate from Columbia University in 1950. He accepted an instructorship at the University of Washington, Seattle, was awarded a Guggenheim Memorial Fellowship in 1961 for study at the National Research Council Laboratories at Ottawa and at Karlsruhe. He joined the staff at Yale University in 1962. . . . Maurice A. Lynch, Jr., (B. S. Boston College, 1943) Ph.D. in chemistry M.I.T. in 1949, has been named General Manager of the Crystal Products Department of the Union Carbide Corporation. After graduating from Boston College he attended the Class "A" Meteorology School at the University of California for nine months until called to active duty in the Army Air Corps where he attained the rank of first lieutenant. He served as a meteorologist in the United States and in Europe until 1946 when he enrolled at M.I.T. as a candidate for the doctorate in inorganic chemistry with a minor in radio and nuclear chemistry. While a graduate student he lived in postwar Westgate with his wife and two children, and was chairman of the Westgate Council. In 1949 he accepted a position with Linde Air Products, a unit of Union Carbide and Carbon Corporation, Tonawanda, N. Y.—Leicester F. Hamilton, Correspondent, 4-254, M.I.T., Cambridge, Mass. 02139

VI

Lieutenant Commander Henry Cox. U.S.N., Sc.D. '63, received the David W. Taylor Award for Scientific Achievement for 1966. This award is presented each year to the scientist at the Naval Ship Research and Development Center (formerly the David W. Taylor Model Basin) who has made the most outstanding contributions in research and development. the citation reads in part, "For your rare combination of knowledge, initiative and foresight in planning of and approach to new concepts in the field of acoustics and vibration. Your early realization of the necessity for improving and 'up-dating' the AUTEC and ADAC systems, your vital concern for the ultimate outcome which would provide a more efficient method of cooperation with the Applied Mathematics Laboratory, . . . your technical insight, your leadership qualities, your superior talent and conscientious interest in providing individual and class instruction to your professional associates in the matter of sound and rational statistical theory. . . have earned for you a reputation of sincerity and dedication which will have far-reaching advantages and immeasurable potential value to the Navy and to the Defense Department." Dr. Cox's undergraduate work was in physics at the College of the Holy Cross in Worcester, Mass. . ward W. Kimbark, S.M. '33, ScD. '37, is an electrical engineer with the Bonneville Power Administration in Portland, Oregon, where design work on the nation's longest direct-current transmission line (853 miles, The Dalles, Oregon, to Los Angeles) has recently been completed. Dr. Kimbark has taught five courses in high-voltage direct-current transmission and is currently writing a book on the subject. He wrote the first two volumes of his outstanding treatise on a-c power system stability as well as a text on elec-



George B. Stone, S.M. '58

trical transmission of power and signals while a member of the electrical engineering faculty at Northwestern University, 1939-50, completing the third volume in 1956. He had an unusual experience as Professor of Electric Power, Division of Electronics, Instituto Tecnologico de Aeronautica, Sao Jose dos Campos, est. S. Paulo, Brazil from 1950 to 1955 acting as head of the Division for about two years. Returning to the United States in 1955 he became Dean of the School of Engineering, Seattle University, Seattle, Wash., until 1962 when he took up his present full-time engineering practice. In the summer of 1966 he was sent by BPA to the C.I.G.R.E. meeting in Paris as co-author of a paper on series capacitors. Sightseeing included Florence before the flood and the chateaux of the Loire Valley.

Gary L. Benton, S.M. '59, has been appointed Corporate Vice President of Gregory Fossella Associates of Boston. He will direct the company's marketing services in the area of product and package design, graphic communications, and corporate identity programs. Prior to his present appointment he was associated with M.I.T.'s Project INTREX under the direction of Dr. Carl F. J. Overhage. His undergraduate work was done at Carnegie Institute of Technology. . . Eugene W. Boehne, S.M. '28, Director of Course VI-A 1947-60 and now consultant, research and development, with the I-T-E Circuit Breaker Company in Philadelphia, is still pursuing his fascinating hobby of growth patterns in nature and applications of number theory to the designs of artists and architects. A clipping from Technician reported his illustrated talk, "Nature, Art and Arithmetic," before the Technical Club of Dallas, Texas. He presented a similar talk in the Boston area during the summer of 1967. His undergraduate work was taken at Texas A & M University where he later received professional and doctoral degrees. . . . Emmett H. Bradley, S.M. '50, has been selected as President and member of the Board of Atlantic Research Corporation. Dr. Arthur W. Sloan, Chairman of the Board, in his announcement of Mr. Bradley's selection, said, "This dynamic young man epitomizes the new breed of professional

business managers who have emerged in our generation. He has played a major part in Atlantic Research's emergence as a leader in sophisticated research." In his new position he will play an important role in the forthcoming merger of Atlantic Research and the Susquehanna Corporation. His activities as Vice President and General Manager were reported in the January 1967 Technology Review.—Karl L. Wildes, Correspondent, Room 4-232, M.I.T., Cambridge, Mass. 02139

XIII-A

Now that a new academic year has begun perhaps this is a good time to bring all alumni a progress report on XIII-A on campus. Nineteen officers were graduated in June and 35 began their first classes a few days later. This large class brings us to a present strength of 84 including 63 U.S.N., 10 Coast Guard, 3 Canadian, 2 Netherlands, 2 Greek, 2 Turkish, 1 Chilean, and 1 Vietnamese officers. This is the largest number in XIII-A since 1963 and the largest number of U.S.N. officers since 1952. . . . Our congratulations go to Captain Ries Heller. U.S.N., Sc.D. '50, who was chosen by the University of Michigan to receive the University's Sesquicentennial Award. This special award was created exclusively for the University's anniversary year to honor alumni whose careers have reflected the Sesquicentennial theme "Knowledge, Wisdom, and the Courage to Serve." The award was presented to Captain Heller at the Special College of Engineering alumni dinner on 21 September 1967. . . . On 13 June 1967 Rear Admiral Arthur B. Engel, U.S.C.G., S.M. '45, became the Coast Guard Academy's 26th Superintendent. One of the Coast Guard's newest flag officers, Admiral Engel's command of the Academy follows four years there as head of the Applied Science and Engineering Department. He has seen previous duty as engineering officer aboard cutters Duane and Pontchartrain, as Chief Engineer of the Seattle District and as Commanding Officer of the Coast Guard Yard in Baltimore.

Last May we sent a newsletter to all XIII-A graduates we could locate. Here are some notes we received: Schuyler Pyne, S.M. '30, is enjoying retirement in Annapolis, Md., where his activities are now limited to SNAME and local and national historic and patriotic groups. . Mario Vangeli, S.M. '34, is teaching graduate courses at George Washington University. . . . Commander R. A. Duin, U.S.C.G., Naval Engineer '55, is busy as Chief of Production at the Coast Guard Yard in Maryland building new 210 ft. cutters. . . . Bob Adams, S.M. '48, retired from the Coast Guard in July and is now working at George G. Sharp, Inc. . . . Ted Gerber, S.M. '46, is with Mobil Oil Corporation working hard to fund son Ted's tuition at Lehigh this fall. . . . Commander W. J. Broughton, R.C.N., N.E. '61, is currently in charge of engineering at the Canadian Dockyard at Halifax. . . . Dick Smith, N. E. '50, is

at the IBM Research Center in Yorktown Heights, N. Y., and would be delighted to see XIII-A grads. . . . Cliff Gerde, S.M. '44, is Assistant Dean for Academic Affairs at the Calumet Campus of Purdue University. . . . Ralph Gerber, S.M. '45, is now with John J. McMullen Associates, Inc., and reminds us that the founder of this successful company of naval architects, marine engineers, and consultants is John McMullen, S.M. '45.

Phil Erkenbrack, S.M. '48, is back in Washington, D. C. . . . Commander Frank Alavrez, U.S.N., Ph.D. '66, is leaving the David Taylor Model Basin for duty in Vietnam. . . . Commander Bob Sims. U.S.C.G., N.E. '59, has recently been assigned as Chief Engineer, New Orleans Coast Guard District. . . . Alvey Wright, S.M. '39, has retired from the Navy and is Deputy Director for Operations, Department of Transportation, State of Hawaii. . . . Commander H. A. Shenker, RCN, N.E. '54, is now on the Canadian Staff, Washington, D.C. . . . Calvin Bolster, S.M. '23, is still active as a consultant with Aerojet General after retiring as head of R & D at General Tire Rubber Company. . . . Lieutenant Millard Firebaugh, U.S.N., N.E. '66, tells us he plans to be married in September. . . . Captain Bob Desel, U.S.N. N.E. '52, is on the Staff of the Military Sea Transport Service, Atlantic Division, enjoying his exposure to the commercial end of the Navy. . . . Captain M. Vincent, U.S.N., N.E. '50, visited M.I.T. recently; Buck is now Commanding Officer and Director of the Naval Ship Research and Development Center (David Taylor Model Basin). He returned to the U.S. after a lengthy tour with the Naval Mission in Brazil.... Commander James Lisanby, U.S.N., N.E. '56, visited M.I.T. in early September. Jim is attending the Program for Management Development at Harvard Business School and will be in the area throughout the fall.—Robert E. Stark, Correspondent, 5-317, M.I.T., Cambridge, Mass. 02139

Sloan Fellows

Sloan Fellows will note with special interest the report elsewhere in this issue of Technology Review of the appointment of **John M. Wynne**, '56, to be Vice President—Organization Systems at M.I.T. Mr. Wynne's association with the Sloan Fellowship Program began when he held the fellowship in 1955-56; two years later he came back to M.I.T. to direct the Program, an assignment he held until 1961.

Harold N. Bogart, '54, of the Ford Motor Company has completed his term as Vice President of the American Society for Testing and Materials.

John H. Gernstenmaier, '52, who has been President of Motor Wheel Corporation in Lansing, Mich., has returned to Akron, Ohio, to be director of all domestic manufacturing for the parent Goodyear Tire and Rubber Company. Mr. Gerstenmaier's previous assignments for Goodyear have Included manager of Industrial Products Development, plant manager for industrial products in Akron, and initial operation of a new automotive interior trim plant in Logan, Ohio. He will be missed in Lansing: in four years there Mr. Gerstenmaier had been on the board of the Community Chest, Urban League, Lansing Symphony, and Junior Achievement, and he was a member of the Steering Committee of the Y.M.C.A.'s "Operation Cool."

Richard J. Howe, '65, is now General Manager—Production Research for Esso Production Research Company, a research affiliate of the Humble Oil and Refining Company; he is in charge of all production research and engineering functions. Mr. Howe was formerly Manager of the Drilling and Completion Division and he is considered an authority on offshore drilling and production; he has recently been named a Director of the Marine Technology Society—the first petroleum industry representative to be so honored.

In connection with the consolidation of all United States Steel Corporation Great Lakes vessels into a single fleet, Robert H. Lucas, '51,General Manager—Lake Shipping has relocated in Cleveland, Ohio.

Speaking to the Western Society of Engineers last year, Robert A. Kraay, '57, General Manager of Western Electric Company's Central Region, cited pitfalls in engineering administration created when managers make three unjustified assumptions: 1. That engineers are satisfied with their jobs unless they indicate otherwise; 2. That communications between engineers and administrators are good because the two are closely related; and 3. That engineers can always effectively use technical assistants. The important thing, he said, is for administrators to be aware of the nature of engineering so they can more fully appreciate the problems engineers face. "We must think of the engineer." he said, "as a person who is likely to react emotionally to emotional situations, who needs to know just as much as any other member of management in order to reach similar conclusions, and who must learn skills-such as the use of technical assistance-which don't come naturally."

Chas. Pfizer and Company, Inc., has promoted **George B. Stone**, '58, to be General Manager of Pfizer Laboratories with overall responsibility for all of the company's domestic pharmaceutical marketing business. He has previously (since 1958) been General Manager of Pfizer's J. B. Roerig Division.

Guy W. Nichols, Jr., '61, former Assistant to the President of the New England Power Service Company in Boston, has been elected a Vice President of the New England Electronic System. He will have executive responsibility for the operation of the system's dispatching, construction, and labor relations.

FOURTH ANNUAL TOUR PROGRAM-1968



These tours are based on special reduced air fares which offer savings of hundreds of dollars on air travel. For example, the tour to India is based on a special fare, available only to groups and only in conjunction with a tour, which is almost \$400 less than the regular air fare. Special rates have also been obtained from hotels and sightseeing companies. Air travel is on regularly scheduled jet flights of major airlines such as Japan Air Lines and B.O.A.C.

The tour program covers two areas—the Orient and India—where those who might otherwise prefer to travel independently will find it advantageous to travel with a group. The itineraries have been carefully constructed to combine the freedom of in-

Japan Air Lines and B.O.A.C.

The tour program covers two areas—the Orient and India—where those who might otherwise prefer to travel independently will find it advantageous to travel with a group. The itineraries have been carefully constructed to combine the freedom of individual travel with the convenience and savings of group travel. There is an avoidance of unnecessary regimentation and an emphasis on leisure time, while a comprehensive program of sightseeing ensures a visit to all major points of interest. Hotel reservations are made as much as a year and a half in advance to ensure the finest in accommodations.

In past years, separate tours have been offered for Harvard and Yale alumni. Air fare regulations for 1968 will permit intermingling of alumni on any tour, and the full program is being offered to alumni of Harvard, Yale, Princeton and M.I.T., making possible a wider choice of departure dates.

THE ORIENT 30 DAYS \$1499

Mar. 23-Apr. 21 Jun. 29-Jul. 28 Sept. 21-Oct. 20

The fourth consecutive year of operation for this fine tour, which offers the true highlights of the Orient at a sensible and realistic pace. Eleven days will be spent in JAPAN, divided between TOKYO, the ancient "classical" city of KYOTO, and the FUJI-HAKONE NATIONAL PARK. Five days will be spent in HONG KONG and four in the fascinating city of BANGKOK. Shorter visits to SINGAPORE and the lovely island of FORMOSA complete the itinerary. Optional pre and post tour stops may be made in Honolulu and the West coast at no additional air fare.

A complete program of sightseeing will include all major points of scenic, cultural and historic interest. Among the many features will be: a tour of the canals and floating markets of Bangkok with breakfast at a waterside restaurant; an authentic Javanese "Rijsttafel" in Singapore; a launch tour of Hong Kong harbor at sunset, with dinner at a floating restaurant; visits to the Toroko Gorge and the new National Palace Museum in Taipei; a trip on the ultramodern 125 m.p.h. express train in Japan,

as well as comprehensive tours of the cultural treasures of Kyoto, full day excursions to Nara and Nikko, and other programs, all fully described in the tour brochure.

Tour dates have been chosen to coincide with special seasonal attractions in Japan: the spring cherry blossoms and beautiful autumn leaves (Tours 1 and 3) and the famous Gion Festival in Kyoto, probably the most colorful and historic pageant in the Orient (Tour 2). Total cost is \$1499 from California, \$1699 from Chicago, \$1737 from New York and \$1747 from Boston.°

INDIA Including NEPAL and PERSIA 29 DAYS \$1499

Oct. 5-Nov. 2

This tour presents an unusual opportunity to see the splendidly diverse and fascinating subcontinent of India, together with the once-forbidden kingdom of Nepal and the rarely-seen splendors of ancient and medieval Persia. Here is India from the mighty Himalayas to the palm-fringed Bay of Bengal: BOMBAY, the great seaport and traditional "gateway to India"; the magnificent cave temples of AJANTA and ELLORA, whose thousand year old frescoes are among the outstanding achievements of Indian art; MADRAS, in the south, closely associated with Elihu Yale; the great industrial city of CALCUTTA; then a thrilling flight into the Himalayas to KATHMANDU, capital of the kingdom of NEPAL, where ancient palaces and temples abound in a land still relatively untouched by modern civilization; the holy city of BENARES on the sacred river Ganges; AGRA, with time to see not only the Taj Mahal but many other celebrated monuments of the Moghul period such as the great Agra Fort and the fabulous deserted city of Fatehpur Sikri; the walled "pink city" of JAIPUR and nearby Amber Fort; the unique hill city of UDAIPUR, noted for scenic lakes, gardens, and delicate white marble palaces; NEW DELHI, the great capital of the nation; followed by a restful stay in the fabled beauty of the VALE OF KASHMIR, surrounded by the snow-clad Himalayas. After India comes exotic PERSIA (Iran): hundreds of miles to the south of Teheran lie PERSEPOLIS, the great royal capital of Darius and Xerxes in the 5th century B.C.; and ISFAHAN, the fabled capital of Persia in the 15th-17th century Renaissance, with its palaces, gardens, bazaar, and justly famous tiled mosques.

Transportation is by air, motorcoach, motorlaunch and elephant. Outstanding accommodations include luxurious houseboats on Dal Lake in Kashmir and hotels that once were palaces of Maharajas. Total cost is \$1499 from New York.°

*Special rates from other cities. Tour cost includes:

Jet Air, Deluxe Hotels, Meals, Sightseeing, Transfers, Tips and Taxes.

For Full Details Contact: Alumni Flights Abroad P. O. Box 99 Lenox Hill Station New York, N. Y. 10021 Brewer Engineering Laboratories, G.A. Brewer '38, Inc.

Consulting Engineers

Experimental Stress Analysis, Theoexperimental Stress Analysis, Theoretical Stress Analysis, Vibration
Testing and Analysis, Specialized
Electro-Mechanical Load Cells and
Systems, Structural Model Testing
and Fabrication, Strain Gage Conditioning and Monitoring Equipment.

Marion, Massachusetts 02738 (617) 748-0103

Capitol **Engineering** Corporation

Consulting Civil Engineers Robert E. Smith '41, President Dillsburg, Pennsylvania, USA

Jackson & Moreland

Engineers and Consultants Division of United Engineers & Constructors, Inc. Boston, Massachusetts

The Kuljian Corporation

Engineers-Consultants Utility-Industrial-Chemical Power Plants (Steam, Hydro, Nu-clear), Public Works, Processing Plants, Oil Refineries, Textile Plants, Institutions, Highways, Expressways, Airports & Facilities, Military Installations

H.A. Kuljian '19, E.J. Healy '24 A.H. Kuljian '48 1200 North Broad Street Philadelphia, Pennsylvania 19121

Cleverdon, Varney and Pike

Consulting Engineers

Structural, Electrical, Civil, Heating and Ventilating, Air Conditioning,

120 Tremont Street Boston, Massachusetts

Loomis and Loomis

Consulting Professional Engineers Structures, Foundations Windsor, Connecticut

Charles Nelson Debes C.N. Debes '35 Associates, Inc.

Engineers and Consultants Structural, Electrical, Mechanical, Acoustical, Industrial, Commercial and Municipal Projects

915 East State Street Rockford, Illinois

Metcalf & Eddy **Engineers**

Boston-New York-San Francisco-

Eadie, Freund & Campbell

Consulting Engineers Mechanical, Electrical, Sanitary, Air Conditioning, Power, Process Layouts

James K. Campbell '11 257 Park Avenue South New York, New York 10010

Mueser, Rutledge, Wentworth & Johnston

Consulting Engineers

Foundations for Buildings, Bridges and Dams-Tunnels-Bulkheads-Marine Structures-Soil Studies and Tests-Reports, Design and

William H. Mueser '22, Philip C. Rutledge '33

415 Madison Avenue New York, New York 10017

Fabric Research Laboratories, Inc.

Research, Development, and Consultation in the Fields of Fibrous, Organic, and Related Materials

W.J. Hamburger '21, E.R. Kaswell '39, K.R. Fox '40, M.M. Platt '42

1000 Providence Highway (At Route 128 and US 1 Interchange) Dedham, Massachusetts

Maurice A. Reidy **Engineers**

Foundations and Soil Mechanics Structural Designs, Buildings, Bridges 101 Tremont Street

Boston, Massachusetts 02108

Fay, Spofford & Thorndike, Inc.

Engineers

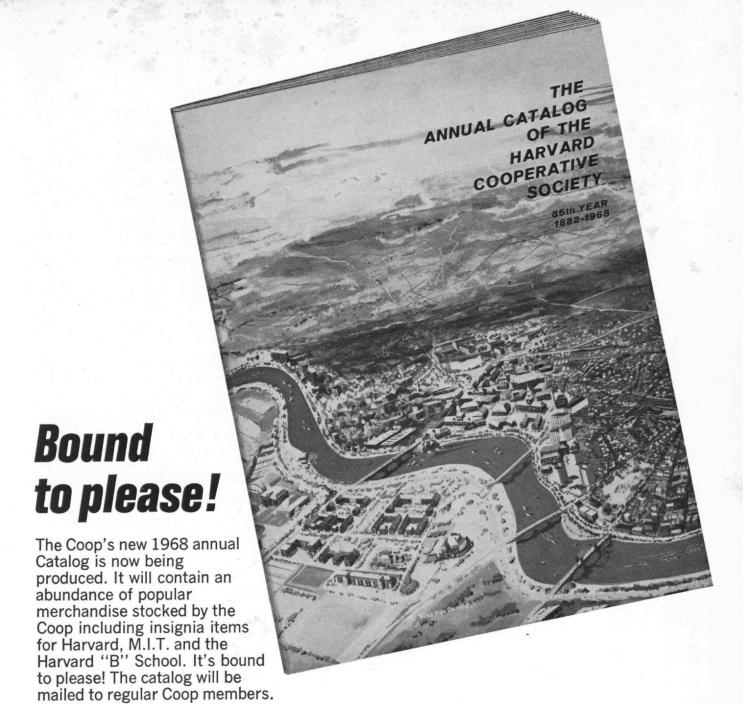
Boston, Massachusetts

Soil Testing Services, Inc.

Consulting Soil and Foundation

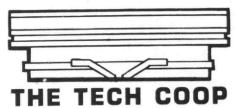
Site Investigations, Foundation Recommendations and Design. Laboratory Testing, Field Inspection

Clyde N. Baker, Jr. '52, Sylvio J. Pollici '56 111 Pfingsten Road Northbrook, Illinois



If you are not a Coop Member, you may also receive a free copy simply by filling out and mailing the coupon below. Don't delay. Mail the coupon today and we will send you your free 1968 Coop Catalog.

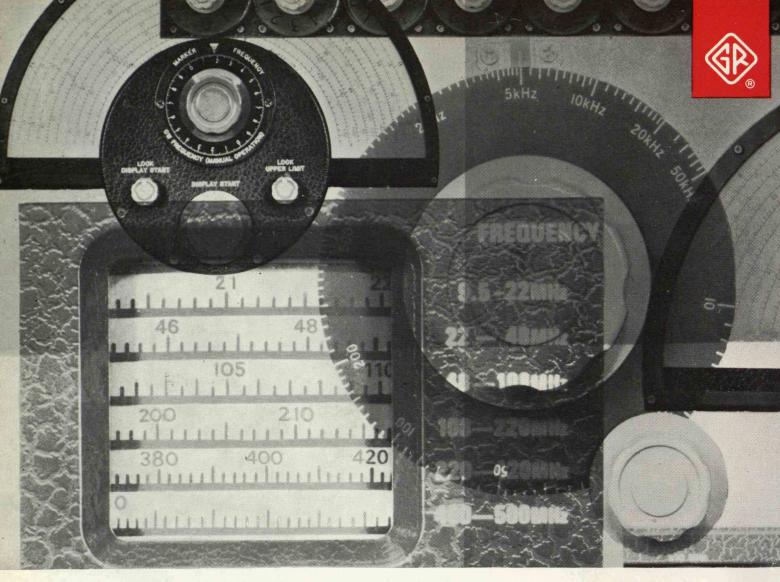
Gentlemen:	
Please include me in your 1968 Coop Catalog Mailing list. I am an alumnus of:	
☐ Harvard ☐ M.I.T.	
NAME	
ADDRESS	
CITY	
STATE	7IP



84 Massachusetts Avenue, Cambridge, Mass. 02139

Regular Hours: 8:50 - 5:30 PM, Mon. - Fri. / Sat. 9:20 - 6 PM

Free Parking . . . On Saturdays at 3 spacious Parking areas adjacent to the Student Center.



Dial GR for Sine-Wave Signals

Over 100 different models of GR oscillators, signal generators, and synthesizers are listed in our catalog. These sine-wave signal sources provide a wide choice of frequencies, power outputs, and modulation and sweeping capabilities. For instance:

Included among the oscillators are our four new "sync-able" oscillators, each a small (8 x 6 x 8 in.),self-contained unit with a sync jack for phase-locking to an external signal. These oscillators offer a wide choice of performance: fixed frequencies (to 10 kHz) or continuous tuning (to 2 MHz), up to 1-watt output, as much as 0.001 % short-term frequency stability, and distortion as low as 0.05% or less.

If you need a high-resolution signal source with a wide choice of operating features, you can satisfy your need with one of the 80 versions of our frequency synthesizers. Their modular construction makes it possible to order any of the four basic models with from three to seven manual step-decade modules, programmable modules, and with or without a continuously adjustable decade module that provides additional resolution and sweep capability. Upper frequency limits of the four basic models are 100 kHz, 1 MHz,

12 MHz, and 70 MHz with maximum possible resolutions of 0.0001, 0.001, 0.01, and 0.1 Hz, respectively.

The newest addition to our ensemble of sine-wave sources is the 1026 Standard-Signal Generator. This unique instrumen puts out $\frac{1}{2}$ watt into 50 Ω (10 V behind 50 Ω , 5 V when modulated), has excellent output leveling, and has true single-dial tuning over its entire 9.5- to 500-MHz frequency range. The ease of operation and outstanding performance of the 1026 in the most critical applications must be experience d to be appreciated. Request a demonstration and see for yourself.

Prices for GR sine-wave signal sources range from \$225 for a "sync-able" aud o oscillator with 11 fixed frequencies to \$7515 for a full-complement, 70-MHz frequency synthesizer. For complete information, write General Radio Company, W. Concord, Massachusetts 01781; telephone (617) 369-4400; TWX (710) 347-1051. Sales Engineering Offices are located in major cities throughout the United States and Canada.



Type 1026 Standard-Signal Generator, \$6500 in U.S.A.

GENERAL RADIO